Play Unit Preferences and Social Play of Young Children in Preschool Playgrounds

by

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B.S.L.A., Washington State University, 1981

A MASTERS THESIS

submitted in partial fulfillment of the

requirements of the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1988

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ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to my graduate committee for their interest and support throughout this study. Professor Susan Wanska and Professor Beverly Briggs were invaluable in helping to ground "the foot I placed into the discipline of child development." Their enthusiasm and expertise greatly enhanced my learning throughout the process. Professor Lorn Clement gave a great deal of valuable input and helped to kindle the spark in the early stages of the study. Professor Ken Brooks, who served as committee chairman, provided a great deal of input and direction throughout the project. I appreciate his willingness to direct the research, and have benefited academically and professionally from his divergent thinking and problem solving abilities.

I would also like to express my appreciation to the children, parents, teachers, and administrators of Hoeflin Stone House Child Care Center, the Early Childhood Laboratory, and Trinity Community Preschool for their willing participation in the project.

Finally, and most important, I wish to express my sincere gratitude to my wife Susan and my daughter Jenika for the sacrifices, the love, and the support they have given me during my graduate education. This study is truly the product of a team effort.

TABLE OF CONTENTS

Chapter Page

1 INTRODUCTION 1

Assessing the Quality of Child Care Environments 1
Research Scope and Objectives 2
Research Format 3

2 PLAY AND PLAYGROUNDS 5

Defining Play 6
Theories of Play 7
History of Playgrounds 24
Types of Playgrounds 41
Conclusions 49

3 METHOD AND PROCEDURE 55

Research Intent 55
Definitions 56
Selection of Subject Groups and Study Sites . 59
Data Collection 84

4 RESULTS 90

Play Unit Use 90
Social Interaction 101

5 CONCLUSIONS AND OBSERVATIONS 109

Play Units and Social Interaction . . . 110
Social Interaction and Playground Type . . 117
Implications for Design 119
Implications for Research 121

LITERATURE CITED 123

APPENDIX 128

A. Social Categories of Play Matrices . . 129

LIST OF FIGURES

Page

2.1 Early sand garden in Boston 25

2.2 Plan of Charlesbank Playground . . . 27

2.3 Charlesbank Playground from West Boston Bridge in about 1890 28

2.4 Chicago South Parks: Park Plan No. 1 . . 29

2.5 Emdrup, the first adventure playground, 1943 . 34

2.6 Traditional playground at Northview Elementary School, Manhattan, Kansas 42

2.7 "Designer's Playground" - Ritter Park Playground, Huntington, West Virginia 45

2.8 "Creative Playground" - Syracuse University Early Childhood Education Center Playground, Syracuse, New York 46

2.9 Adventure playground - SBBU, Socialt Boligbyggeris Ungdomsklubber 48

3.1 Play structure in Playground A . . . 61

3.2 Plan drawing of Playground A 62

3.3 Play units in Playground A 63

3.4 Play structure in Playground B . . . 66

3.5 Plan drawing of Playground B 67

3.6 Play units in Playground B 68

3.7 Play structure in Playground C . . . 72

3.8 Plan drawing of Playground C 73

3.9 Play units in Playground C 74

3.10 Playgrounds D and E 78

3.11 Plan drawing of Playgrounds D and E . . 79

3.12 Play units in Playgrounds D and E . . . 80

FIGURES (continued)

Page

3.13 Sample data form: play unit use frequencies . 86

3.14 Sample data form: social patterns of play . 88

LIST OF TABLES

Page

2.1 Erikson's Stages of Play 15

2.2 Piaget's Stages of Cognitive Development . 17

2.3 Categories of Functional Play 19

2.4 Categories of Social Play Described by Parten 22

4.1 Means and Standard Deviations for Play Unit Use in Playground A 92

4.2 Means and Standard Deviations for Play Unit Use in Playground B 94

4.3 Means and Standard Deviations for Play Unit Use in Playground C 96

4.4 Means and Standard Deviations for Play Unit Use in Playground D 97

4.5 Means and Standard Deviations for Play Unit Use in Playground E 98

4.6 Composite of Means and Standard Deviations for Play Unit Use 99

4.7 Composite Contingency Table (play unit x social category of play) 102

4.8 Bar Chart: Percentage of Social Play by Play Unit 103

4.9 Percentage of Social Play by Playground . . 106

4.10 Bar Chart: Percentage of Social Play by Playground 107

A.1 Play Unit Contingency Matrices (playground x social category of play) 129

CHAPTER 1
INTRODUCTION

Provision and regulation of child care have become an increasingly prevalant and controversial social issue facing this country. Over the past three decades the number of women entering the work force has increased, with an associated increase in the number of children in child care environments accompanying this phenomena (Weintraub & Furman 1987). The 1986 Bureau of Labor Statistics Report indicated that from 1980 to 1986, the number of children under the age of 3 with mothers in the work force increased 33%, from 7.5 million to 10 million (Weintraub & Furman, 1987). Hofferth and Phillips (as cited in Weintraub & Furnam, 1987) estimated that by the mid-1990's, two-thirds of women with preschool-aged children, and three-fourths of women with school-aged children will be in the work force. This report suggested that more and more children will be placed into child care environments.

Assessing the Quality of Child Care Environments

Early childhood is a critical period in children's cognitive, social, and physical development. The experiences children have during this period are essential in creating a base upon which their life experiences will be structured.

Factors which contribute to quality child care environments include: a) the number of children cared for by each staff member (staff-child ratio), b) the number of children cared for together (group size), c) the qualifications of the caregivers, and d) the degree to which the physical environment promotes and fosters positive learning experiences (child/environment interaction) (Weintraub & Furman 1987).

The National Association for the Education of Young Children (NAEYC) has developed criteria for assessing the physical environment of quality early childhood education programs. As stated in the accreditation criteria, the objectives for indoor and outdoor physical environments are:

> GOAL: The indoor and outdoor physical environment fosters optimal growth and development through opportunties for exploration and learning.
>
> RATIONALE: The physical environment affects the behavior and development of the people, both children and adults, who live and work in it. The quality of the physical space and material provided affects the level of involvement of the children and the quality of interaction between adults and children. The amount, arrangement, and use of space, both indoors and outdoors, are to evaluated. (NAEYC, 1984 p.25)

Research Scope and Objectives

Objective guidelines are available for the amount of space per child and boundary definition of outdoor play environments. For example, the Kansas Department of Health and Environment (KDH&E) regulations for licensing preschools and child care centers requires an outdoor play space containing a minimum of 75 square feet per child protected by a fence a minimum of four feet in height (KDH&E, 1986).

Determining the play and educational value of play spaces and equipment is more difficult than defining physical specifications. This study employed two factors which may be used to determine "play value": a) children's willingness and desire to become involved with a play unit (preference), measurable as frequency of use, and b) the types of social interaction that are stimulated and supported by a play unit.

This study is an interdisciplinary effort between the disciplines of landscape architecture and early childhood education to gain further understanding of where and how children play in outdoor environments designed for their use. The prospective audience includes: a) environmental designers charged with designing and furnishing spaces for children's use, b) early childhood educators and administrators deterimining priorities for allocation of resources for children's play environments, and c) researchers in child development and enviromental design seeking new information which can be practically applied by practitioners.

Research Format

Chapter 2: Play and Playgrounds provides background information for the study. Included are classical and modern theories of play, a historical overview of provision of play spaces for children leading to present trends and studies in playground design, and definition of three general playground types. Chapter 3: Method and Procedure will present the research intent, define the variables and terminologys, and discuss the methods and procedures for data collection. Chapter 4: Results will summarize the data and the treatments used in their analyses. Chapter 5: Conclusions and Observations will evaluate the results of the study. Each play unit will be discussed in terms of interaction between children's preference and social play. Implications for future research will also be discussed in this section.

CHAPTER 2

PLAY AND PLAYGROUNDS

The purpose of this chapter is to provide background information for this research project. The first sections will describe the characteristics of play and provide an overview of classical and contemporary theories of the causes and purposes of play. The following sections will discuss the trends and issues that have influenced modern outdoor play environment design. The final section will describe the characteristics of three broad categories of playground types.

PLAY

Play is a characteristic behavior of all higher forms of animals. We can identify playful behavior in ourselves and others. However, adequately defining the multitude of behaviors we may classify as being play is a difficult matter. Play is often referred to as "the work of childhood," and it indeed is the process by which children come to understand their environment and their position within it. Fredrich Froebel, the originator of the idea of the kindergarten, eloquently describes the nature of children's play:

> Play is the purest, most spiritual activity of man at this stage, and at the same time, typical of human life as a whole - of the inner hidden natural life in man and all things. It gives, therefore, joy, freedom, contentment, inner and outer rest, peace with the world (Harris, 1906, p.55).

Defining Play

Theorists and philosophers dating back to Plato, professional educators of the past two hundred years, and researchers of this century have yet to develop a universally acceptable definition of play (Frost & Klein, 1979). In the absence of such a definition, it seems useful to list some of the commonly accepted characteristics of play. Frost and Klein (1975) and Wanska (personal communication, November 5, 1987) describe the characteristics as:

1) Play requires active involvement.
2) Play is spontaneous and voluntary.
3) Play is fun.
4) Play is process rather than product oriented.
5) Play is self-initiated.
6) Play is serious.
7) Play is linked to exploratory behaviors.
8) Play enhances learning.

Theories of Play

A number of theories have been generated to explain and, in some cases, to predict play behavior. Early theories tended to stem from "arm chair" observations of children at play, and attempted to describe a cause and/or function for the phenomena. More recent theories of play are based on a developmental or psychological perspective.

Classical Theories

The classical theories of play were generated in the 18th and early 19th centuries. They attempted to explain what causes play and the function it serves. Ellis (1973) questioned their validity as theories because ". . . the extant 'theories' of play are really explanatory ideas or concepts that are neither explicit nor extensive enough to be properly classified as theories." (p.24). However, they provide an insight into early explanations of play and are worthy of discussion.

The classical theories can be organized into two sets of contradicting schools of thought: the surplus energy theory versus the relaxation theory, and the recapitulation theory versus the practice theory.

Surplus Energy Theory.

The idea that surplus energy is a motive for play can be traced to the writings of Frederich Schiller, an 18th century German poet, and Herbert Spencer, a 19th centry British philosopher (Ellis, 1973). Based on Schiller's earlier work, Spencer wrote,

> The animal works when some want is the motive for his activity, and plays when the superabundance of energy forms this motive - when overflowing with life itself urges him to action (Groos, 1898, p.2).

Groos cited a number of other authors expressing similar ideas, suggesting that the perspective that play releases excess energy was common during the 19th century (Ellis, 1973).

The surplus energy theory was based on an assumption that an organism is capable of generating a finite level of energy. Any surplus energy not expended on survival is seen to accumulate and must be expended in some nonproductive form to return the organism to equilibrium. Play, viewed as a nonproductive behavior, acts as the "release valve" for the build-up of excess energy. This theory has a common sense appeal. Anyone who has seen school age children burst onto a playground after a period of sedentary work will agree that there seems to be some validity to this theory (Johnson, Christie, & Yawkey, 1987). It suggests that the reason children, as an age group, exhibit more play behavior than adults is because adults must expend energy to meet family survival needs while children having no such responsibilities are thus left with excess energy. A similar argument may be made explaining the fact that higher forms of animals on the evolutionary scale are also seen to exhibit more play behavior than lower forms. Higher animals are able to more efficiently make adaptations to their environment, leaving them with excess energy to be utilized in play (Johnson et al., 1987).

Ellis (1973) provided two criticisms of the surplus energy theory: a) It does not explain the fact that children play when fatigued or play to the point of fatigue, suggesting that a surplus of energy is not required for play; and b) The process of evolution should have tailored an organism's supply of energy to the demand its environment places upon it.

Relaxation Theory.

Contradicting the surplus energy theory, are two closely related theories - the recreation theory proposed by German poet Moritz Lazarus and the more recent relaxation theory of G. T. Patrick (Ellis, 1973). Each of these theories are based on the premise that after a sustained period of work an organism requires a regeneration period which may include sleep and/or active play (Ellis, 1973; Frost & Klein, 1979; Johnson et al., 1987). Lazarus (as cited by Sapora and Mitchell, 1961) , stated:

> After work we require rest which accomplishes recuperation. But hardly ever does mere empty, inactive rest suffice for recuperation (Sappora & Mitchell, 1961 p.81).

Patrick (1961) expanded further on this concept, arguing that play and recreation serve to restore energy after a period of work. These theories may provide an explanation and justification for recreational activities of adults as recuperation from the stresses of work. However, it does not adequately explain playful behavior in children, and other "non-workers", who do not need to recuperate from work. (Ellis, 1973)

Recapitulation Theory.

The recapitulation theory stems from Darwin's theory of evolution suggesting that humans evolved from lower forms of life. Scientists in the 19th century discovered that as the human embryo becomes increasingly complex, it goes through periods of development when it resembles lower forms of life (Johnson et al., 1987). For example, at one point the human embryo has structures which are similar to fish gills. Later these structures become part of the head and neck. This discovery led to the theory that "ontogeny recapitulates phylogeny"; the development of the individual reenacts the development of the species. Luther Gulick (1898), applying this theory to children's play, stated:

> It appears to be not only true that the body rehearses the life of the race, it appears to be true that the mind must do so also, and that the plays of children are the rehearsal of the activities of the race during forgotten ages - not necessarily the self-same activities, but activities involving the same bodily and mental qualities. Putting it exactly, play is the ontogenetic rehearsal of the phylogenetic series (Gulick, 1898 p.803).

American psychologist G. Stanley Hall (1916), advancing views similar to Gulick's, wrote,

> In play every word and movement is instinct with heredity. Thus, we rehearse the activities of our ancestor, back we know not how far, and repeat their life's work in summative and adumbrated ways . . . (Hall, 1916 p.202-203).

According to Hall, the purpose of play is for children to work out their primal instincts which are not appropriate to modern life. Thus children climb trees as a throwback to primate ancestors, and engage in gang play in recapitulation of tribal life (Johnson et al., 1987).

Ellis (1973) suggested that the recapitulation theory is the outgrowth of a period of time when we were becoming aware of the origin of the species. He pointed out two criticisms which can be made of the theory: a) A linear progression of play activities which seems to reflect the development of the human species does not exist; and b) The theory does not explain children's fascination with the products of modern technology, such as talking dolls, toy cars, and chemistry sets. Practice Theory.

In direct opposition to the recapitulation theory, philosopher Carl Groos suggested that play is an instinctive behavior with the purpose of preparing young for adult life. Groos (1898) wrote:

> Animals do not play because they are young but they have their youth because they must play . . . for only by so doing can they supplement their insufficient hereditary endowment with individual experience of the coming tasks of life (Groos, 1898 p.75-76).

It is likely that Groos would suggest children involved in socio-dramatic play are practicing for their roles in adult life.

Ellis (1973) believed Groos' theory to be flawed because it suggests that organisms are born with an inherent sense of what skills they will need for the future. It also does not explain playful behavior in adults, who are supposedly prepared for life.

Contemporary Theories

Contemporary theories of play go beyond the earlier theories' attempts to explain why play exists. They may also try to determine the role of play in child development and, in some cases, may try to identify antecedent conditions causing play behavior (Ellis, 1973).

Psychoanalytical Theory.

Sigmund Freud, the founder of psychoanalytical theory, was interested in the role emotional development has in children's play. He proposed that play is motivated by the "pleasure principle" (Freud, 1955); children play for the gratification of achieving a reward. This reward may be tangible, or it may be intrinsic in that the activity is its own reward (Ellis, 1973). The latter may be thought of as gratification of mastery of the environment, similar to Groos' (1898) "joy in being a cause."

Children live in a confusing, complex environment that is difficult to master. Play is a mechanism through which children may come to terms with their environment. Freud (1955) proposed that play may have a cathartic effect in children, allowing them to reduce anxiety over stressful events occurring in their lives. Robert Walder (1933) elaborated on Freud's original concept of cathartic play, explaining the phenomenon of children repeating traumatic experiences over and over in play. Walder (1933) referred to the phenomenon as "repetition compulsion." Repetition of a negative experience allows a child to come to terms with it in small manageable doses.

A child's world is filled with authoritarian figures such as parents, older siblings, and teachers, doctors, firemen and police officers. Freud theorized that through fantasy play, children are allowed the opportunity to try on roles of power. Freud also suggested that children's fantasy play differs from adult fantasy. Children's play creates a fantasy world around real objects, while adult fantasy is separate from reality. Walder (1933), in agreement with Freud, stated that "Fantasy woven about a real object is however nothing other than play (p. 223)."

Cathartic play and fantasy play allow children to be masters of their environment. This may explain why play activity lessens with age; as children grow older the world becomes less confusing and confounding and they gain greater control over it (Ellis, 1973). However, this does not explain the reduction in play which may be triggered by the "pleasure principle." Ellis (1973) suggested there may be a reduction in this class of play behavior as other consequences, such as work and/or reduced vigor, take precedence over it.

Erik Erikson (1950) built on the work begun by Freud and Walder to add new information to understanding of children's play. Erikson described play as a developmental sequence of three stages through which a child's understanding of the world becomes increasingly complex (see Table 2.1 Erikson's Stages of Play).

Table 2.1 Erikson's Stages of Play

Stages of Play Described by Erik Erikson

Stage	Characteristics
Autocosmic Play	exploration of own body and immediate world through repetition of sensual perceptions, kinesthetic perceptions, and vocalizations, etc.
Microsphere	play within the child's own "small world" of manageable toys and objects.
Macrosphere	child shares play with others; child learns when to engage in solitary play and when to engage in social play.

(Frost & Klein, 1979)

Erikson viewed autocosmic play as the child's first orientation to the relationships between physical features and structures. In the microsphere stage the child begins to learn that objects have their own set of properties: they may break, may belong to someone else, or may be confiscated by an authority figure. Erikson (1950) described the microsphere as a "safe harbor" (p.22) to which the child returns when his or her ego needs overhauling. The macrosphere is the final stage of play in which the child is involved in social play. The macrosphere incorporates elements from the earlier stages of play, especially the safe harbor for "the overhauling of shattered emotions after periods of rough going in the social seas." (Erikson, 1950, p.22)

Cognitive-Developmental Theories

Swiss psychologist Jean Piaget is the individual most associated with the cognitive-developmental model for child development. Piaget (1962) theorized that children progress through a developmental sequence of cognitive stages during which their thought processes become increasingly complex (see Table 2.2 Piaget's Stages of Cognitive Development).

Table 2.2 Piaget's Stages of Cognitive Development

Stages of Cognitive Development Described by Jean Piaget

Stage (approximate age)	Characteristics
Sensorimotor (birth to 2 years)	learning through sensory motor actions. Child differentiates self from the environment, learns relationships, and learns cause and effect principles.
Preoperational (2 to 7 years)	egocentric and illogic thought. Child develops language and sophisticated socio-dramatic play.
Concrete Operational (7 to 11 years)	decentered and reversible thought. Child needs to have objects and events present in order to think about them.
Formal Operations (11 years +)	abstract thought. Child's thinking is no longer limited to concrete objects and experiences, and is capable of hypothetical deductive (if, then) reasoning.

(Santrock & Yussen, 1987)

In Piaget's view, knowledge is actively constructed through children's interaction with their environment. According to Piaget (1962), play is more than a reflection of a child's cognitive development, it is a process which contributes to that development. Play takes place in the mind, with the body producing effects in the environment or gathering input for further thinking (Ellis, 1973).

Piaget saw development as a learning process in which organism/environment interactions lead to adaptation, a balance between two complementary processes: assimilation (modifying reality to fit one's cognitive structures) and accommodation (changing those structures to conform to reality) (Johnson et al., 1987). Thus, cognitive development is viewed as an ongoing process in which thinking becomes increasingly specialized as children's encounters with the environment cause them to adjust and readjust their conceptual structures. For example, a child may initially label all four legged animals as "dogs" (assimilation), but through continuing interaction with the environment learns to discriminate "cats", "horses", and "cows" from "dogs" (accommodation). Intelligence is an adaptation process which tends toward permanent equilibrium between assimilation and accommodation (Flavell, 1963).

Piaget built upon the work of Charlotte Buhler (1935) and Karl Buhler (1937) to describe a series of three stages of games which are related to the stages of cognitive development: functional play, symbolic games, and games with rules (Frost & Klein, 1979). Smilansky (1968) elaborated on Piaget's original categories adding a fourth stage which is labeled constructive play. As with Piaget's categories, Smilansky believed that these categories develop in a relatively fixed sequence: a) Functional play - the child is involved in simple repetitive muscle movements and vocalizations with or without objects; b) Constructive play - the child manipulates objects to construct or to "create" something; c) Dramatic play - the child is involved in substitution of roles and objects to create an imaginary situation which satisfies the child's personal wishes and needs; and d) Games with rules - the child accepts prearranged rules and the adjustment of these rules in play.

Figure 2.3 Categories of Functional Play

Piaget's Stages of Cognitive Dev.	K. Buhler (1937)	Piaget (1962)	Smilansky (1968)
Sensorimotor Stage (birth to 2 years)	Functional games	Practice games	Functional play
Preoperational Stage (2 to 7 years)	Construction games Make-believe games	Symbolic games	Construction play Dramatic play
Concrete Operations Stage (7 to 11 years)	Collective games	Games with rules	Games with rules
Formal Operations Stage (11 years +)			

(Frost & Klein, 1979 p.9)

Piaget viewed play as an imbalanced state in which assimilation dominates over accommodation.

> In play the primary objective is to mold reality to the whim of the organizer, in other words, to assimilate reality to various schemas with little concern for precise accommodation to that reality. Thus, as Piaget puts it, in play there is the primacy of assimilation over accommodation. (Flavell, 1963, p.65)

Play is seen as a nonadaptive behavior in which children do not learn new skills. Rather, they practice and consolidate new skills into their repertoire of behaviors during play.

Piaget considered this practice/consolidate aspect of play to be important, because without it new skills may be lost (Johnson et al., 1987).

Russian psychologist Vygotsky (1976) believed that symbolic play has a direct role in the development of abstract thought. Young children are incapable of abstract thought because initially they must have the concrete object present to think about it. However, as children become involved in dramatic play, they begin to transform the meanings of objects for use in play. In dramatic play an object is allowed to symbolize another object, such as a pot with gravel in it symbolizing a pot of macaroni and cheese. Through this process children develop the ability to separate an object from the meaning it has (Johnson et al., 1987).

Other theorists have emphasized the role that play has in the development of creativity and problem solving. Bruner (1972) suggested that because play is process rather than goal oriented, children have flexibility to experiment with a variety of solution seeking processes. For example, a group of children may spend hours constructing a sand castle or block tower only to demolish it to begin the process again. Later they may apply these processes to real-life situations. Sutton-Smith (1967) postulated that experiences learned through symbolic representation of objects in play leads to flexible solution seeking in the future (Johnson et al., 1987).

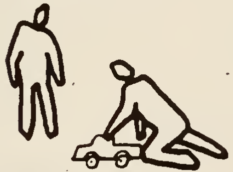
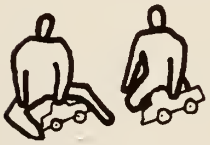
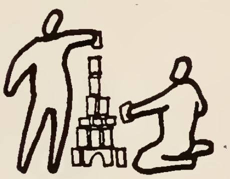
Play as Stimulus Seeking.

Whereas the surplus energy theories suppose that the natural state of the human organism is rest, the theories of play as a stimulus seeking activity suggest that a natural need for arousal exists in the human organism. Therefore, in the absence of sufficient activity there is a drive for stimulation. Play is seen as a stimulus-seeking behavior which can raise arousal to its optimum level (Ellis, 1973).

Social Patterns of Play

Through observations of free play in a nursery school setting Mildred Parten (1932) identified and defined six categories of social play. Parten suggested that during the preschool years social interaction between children increases as they mature and gain experience in social situations. Her classical categories of play continue to be used and refined by researchers today. (see Table 2.4 Categories of Social Play Described by Parten)

Table 2.4 Categories of Social Play Described by Parten

Category of Play (approximate age)	Characteristics
Unoccupied 	The child is not actively involved in play activities. The child may stand in one position, momentarily watching activities of interest, or perform random purposeless behaviors.
Onlooker 	The child exhibits an active interest in the play of other children. The child may ask questions or make suggestions, but does not actively take part in the play activity.
Solitary (2 to 2-1/2 years) 	The child plays alone and independently with objects different from the other children in proximity to them. Although other children may be within speaking distance, the child makes no effort to communicate with them.
Parallel (2-1/2 to 3-1/2) 	The child plays in close proximity to other children with similar toys in a similar manner. The child may mimic the activities of other children, but does not try to modify or influence their play.
Associative (3-1/2 to 4-1/2) 	The child is involved in a play activity which includes social interaction with other children. The child may borrow or lend toys to other children, or be involved in a "follow-the leader" activity. There is no indication that the child is willing to compromise his or her own interests for those of the group.
Cooperative (4-1/2 years +) 	The child is involved in an organized play activity which includes social interaction with other children. The group's activities are organized for the purpose of making some product, achieving some competitive goal, dramatizing some adult or group situation, or playing some formal game.

(Frost & Klein, 1979; Johnson et al., 1987; Santrock & Yussen, 1987)

In a replication of Parten's study, Barnes (1971) found that 3- to 4- year old children display more unoccupied, onlooker, and solitary behavior and less associative and cooperative behavior than Parten did in her original sample. Barnes concluded that today children are less skilled in associative and cooperative play than were children of similar ages in the late 1920's (Frost & Klein, 1979).

In a longitudinal study of social play during the preschool years, Smith (1978) reported that while some children do follow the pattern suggested by Parten, others do not. As children advanced beyond parallel play they tended to be involved in solitary and interactive (associative, and cooperative) play. Other researchers have suggested that parallel and not solitary play is the least sophisticated social level of play (Bakeman & Brownlee, 1979; Frost & Klein, 1979; Johnson et al., 1987; Moore, Evertson, Brophy 1974; Rubin, Maloni, Hornung, 1976).

HISTORY OF PLAYGROUNDS

Design of contemporary playgrounds has been influenced by a variety of historical trends and issues. Early playgrounds, which were generally provided for entertainment of children, have gradually evolved to the development of modern theory of play environment design which proposes that playgrounds should be designed to be safe, challenging environments supportive of children's developmental needs.

Early Playgrounds in the United States

An understanding of society's perceptions of children and play is important to set the stage for creation of open spaces specifically for playgrounds. Until the early 1900's children were thought of as "little adults", having the same needs and performing the same functions in society as adults. Children were expected to work to help support the family. Play, if allowed at all, was to occur in streets, farmyards, or other open areas. Eriksen (1985) suggested that changing perceptions of children and childhood, and thereby play, resulted from a combination of changes in society: a) the passage of child labor laws, b) the acceptance and development of public education, including the extension of the school year from four or five months to nine months, and c) the increasing prosperity of the middle and lower classes in the nineteenth centuries.

The first organized playgrounds appear to have been created in the late 19th century. Many of these were created by humanitarian groups as places for slum children to play away from the filth and danger of the streets (Eriksen, 1985). By 1868 there was a Boston schoolyard devoted to play, and by 1876 there was a playground in the athletic fields of Washington Park in Chicago (Cranz, 1982). However, Eriksen (1985) cited the inception of the playground movement in the United States as the placement of a children's "sand garden" in the Parmenter Street Chapel and West End Nursery in Boston in 1885 by the Massachusetts Emergency and Hygiene Association. The idea for the sand garden was imported by Dr. Marie Zakrzewska, who had seen similar sand gardens in Berlin, Germany (Cranz, 1982; Eriksen, 1985).

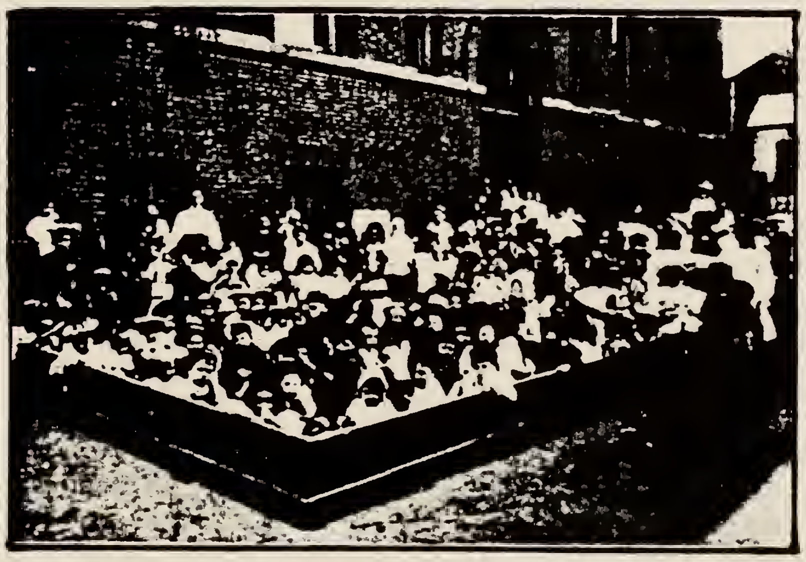


Figure 2.1 Early sand garden in Boston. (Source: Rainwater, Clarence E. 1922. The Play Movement in the United States: A Study of Community. Chicago: University of Chicago Press, p.22, as found in Eriksen 1985, p.10).

The idea quickly spread and within two years ten sand gardens had been built in Boston, mostly near settlement houses. By 1894, sand gardens were on all Boston school properties, however, they were administered with private financing until 1899 (Newton, 1971). The idea spread to other cities and was accepted with such fervor that it forced city governments initially to install playground equipment into existing public open spaces and later to enact policies for the acquisition of land for playgrounds.

> Before 1900 New York, Chicago, Philadelphia, Pittsburgh, Baltimore, New Haven, Providence, and San Francisco had such playground facilities, although these municipalities had not yet passed legislation enabling them to purchase land specifically for this purpose. Boston's City Council pioneered in the movement and dedicated its first playground in 1890, New York's Small Parks Commission was appointed in 1898, and Chicago's legislation was passed in 1901. A further landmark of the movement was its national institutionalization, in 1906, in the Playground Association of America. (Cranz 1982, p.63)

Early playgrounds are characterized as being funded by humanitarian sources for use by young children during the summer vacation period. These playgrounds combined areas for field games and hard surfaced areas furnished with commercially manufactured equipment for physical exercise (Eriksen, 1985).

Eriksen (1985) identified three playground models built before 1900 which represent steps forward in the purpose and design of playgrounds. In 1884, a model playground was set up at Jane Addam's Hull House in Chicago. The purpose of this playground was to provide attractive alternative activities for children who might otherwise be involved in acts of juvenile delinquency. Other model playgrounds were based on the recognition that play had educational as well as entertainment value. Playgrounds designed to serve older as well as younger children and to remain open year-round were set up in Philadelphia, Providence, New York, and Boston. A third playground model was the large recreational park, or outdoor gymnasium. The first park of this type was the Charlesbank Playground in Boston built from 1889-91.

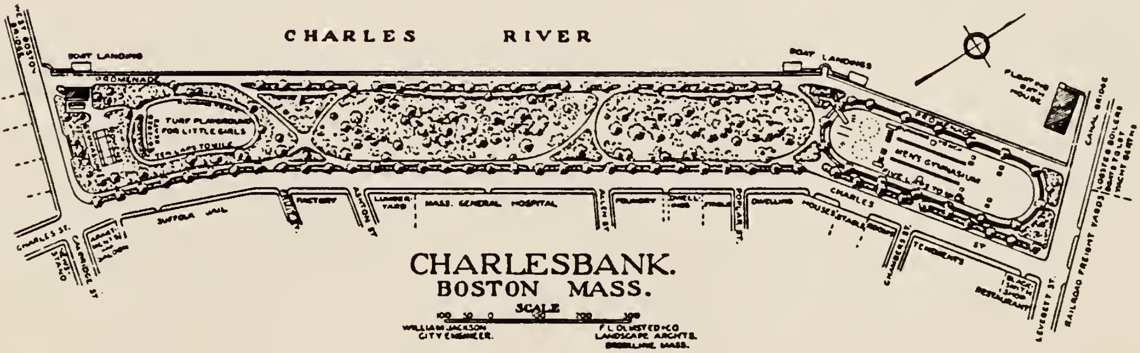


Figure 2.2 Plan of Charlesbank Playground. (Source: Eriksen, 1985, p.11)

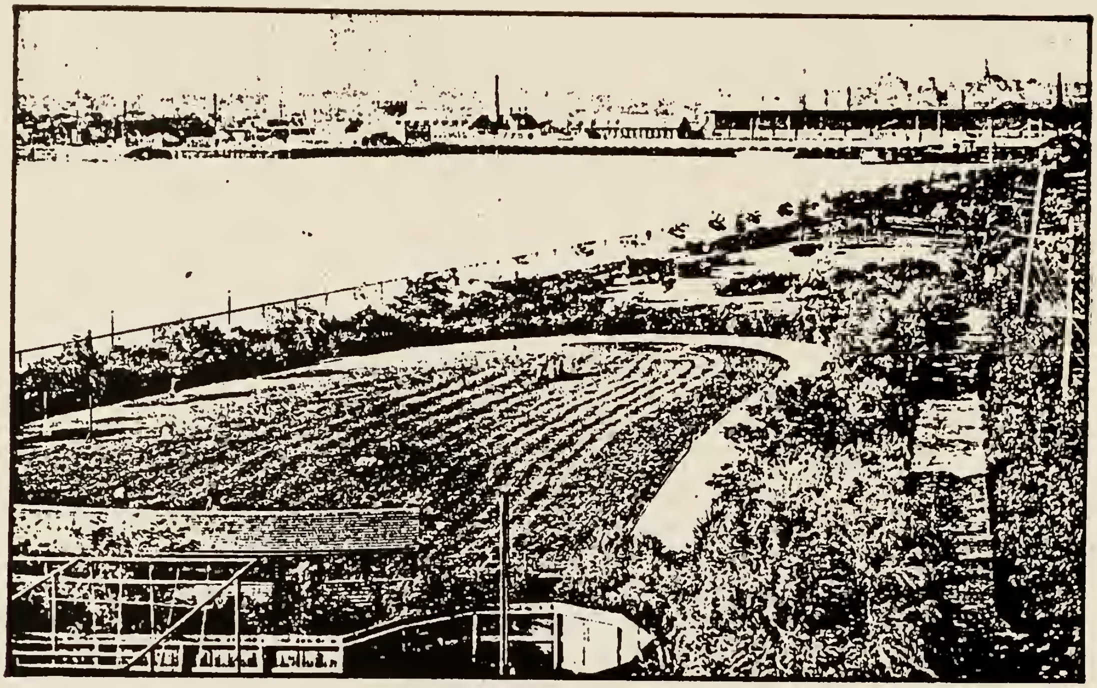


Figure 2.3 Charlesbank Playground from West Boston Bridge in about 1890. (Source: Newton, 1971, p.623)

Charlesbank was proposed by the Massachusetts Emergency and Hygiene Association, designed by Frederick Law Olmsted, and funded by the Boston Park Department. Charlesbank included an open-air gymnasium and running track at one end, a park area in the center, and a gymnasium and a running track for women and a playground for children at the opposite end. Similar recreation parks were built in Louisville, Philadelphia, New York, and Chicago by 1900.

Municipal and School Playgrounds

Charlesbank served as an important model for later development of parks and playgrounds for the working class. The most important early municipal playground system was the Chicago South Park system designed by the Olmsted brothers. In 1903 the Illinois Legislature appropriated one million dollars in bonds to begin development of a series of small parks (Newton, 1971). The park designs contained year-round indoor and outdoor recreation facilities for men, women, and children. Two recreation directors, one man and one woman, were assigned to each park. The playgrounds became effective community centers and were soon emulated by many other cities (Newton, 1971).

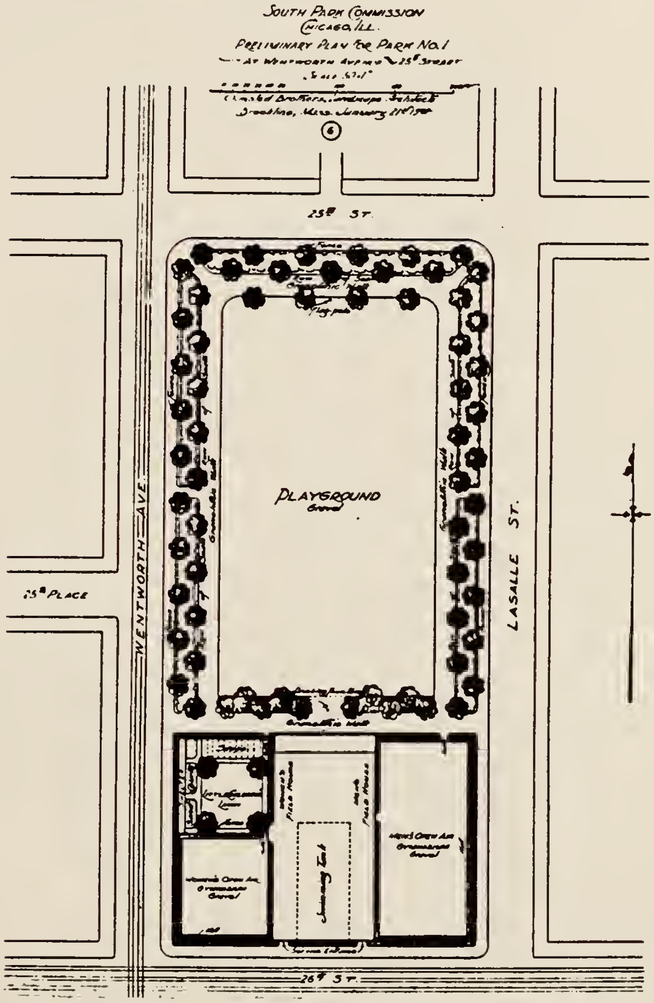


Figure 2.4 Chicago South Parks: Park plan No.1 (Source: Newton, 1971, p.625)

At about the same time that municipal parks were being developed, public funding of playgrounds on school grounds also began. Philadelphia was the first city to institute such a program in 1896. Eriksen (1985) suggested that the number of school playgrounds around the country increased dramatically for two reasons: (a) play and athletics were being introduced as part of school curricula, and (b) communities attempted to limit redundant spending by combining school and community facilities.

Theodore Roosevelt, an avid enthusiast of physical fitness and recreation, endorsed the Playground Association of America in 1906 (Newton, 1971). Roosevelt declared that there could be no more important reform than to provide adequate playgrounds, and in doing so probably influenced a number of communities to appropriate funds for municipal and school playgrounds (Eriksen, 1985).

Many of the characteristics of these early playgrounds are prevalent even today, and constitute a design style which will be defined as the "traditional" playground style later in this chapter. In general, the equipment provided was fixed in place, patterned after amusement park attractions, and had little value beyond providing physical exercise. However, this standardized equipment - slides, swings, seesaws, merry-go-rounds, and so forth, - gained popularity because it allowed a number of children to play in a small area and could be ordered from a catalog by a school board thereby avoiding the cost of hiring a designer. The desire was for easily maintained equipment which could be used by children without much supervision (Eriksen, 1985). By the end of the 1950's American playgrounds were characterized by an area enclosed by a chain link fence, paved with asphalt, containing a slide, swings, a seesaw, a jungle gym, and a merry-go-round (Frost & Klein, 1979).

The evolution of playgrounds into hard surfaced areas with isolated equipment did not go unquestioned. Dr. Joseph Lee, author of Play and Playgrounds (1908), suggested that young children be provided with workable materials for constructive play, and props and spaces for dramatic play. Lee suggested that older children should be provided with spaces for supervised activities such as nature study, caring for animals and gardens, woodworking, contests, and quiet games (Eriksen, 1985). Arthur Leland and Lorna Higbee Leland, developers of playgrounds in St. Paul, recommended soft landing areas under play equipment. The Lelands also advocated the involvement of children in constructive play (Eriksen, 1985).

The voices of Lee, the Lelands, and others like them appear to have gone unnoticed and the trend continued toward traditional playgrounds which are unimaginative at best, and physically dangerous at least. In the late 1970's, the U.S. Consumer Product Safety Commission issued guidelines for playground layout, surface material specifications, and equipment design in response to the hundreds of thousands of injuries which occurred on traditional playgrounds each year (Eriksen, 1985).

Playground Planning in Europe

Open spaces designated for children's play originated in Europe at about the same time as in the United States. Early playgrounds resembled those in the United States in that they tended to be gravel surfaced and included standardized playground equipment patterned after amusement park rides and open space for field games (Eriksen, 1985). Horizontal bars and parallel bars were later incorporated into playgrounds in response to the gymnastic movement, which had been strongest in Sweden and Germany during the nineteenth century (Eriksen, 1985).

Eriksen (1985) cited the development of the adventure playground in Denmark in the 1940's as the most significant development in playground design in the last forty years. Denmark is considered to be a leader in the development of playgrounds. Denmark was the first country to enact legislation requiring play facilities for children in urban housing projects. The country has continued to forge new ground by passing laws legislating maximum walking distance between playgrounds and requiring provisions for age appropriate playgrounds (Eriksen, 1985).

The first adventure playground, "Emdrup," was constructed in Copenhagen in 1943. Emdrup was the brainchild of landscape architect and professor at the Danish Academy of Fine Arts, C. Th. Sorenson. A pioneer of town planning, Sorenson advocated the importance of recreational open spaces in close proximity to dwellings. He suggested incorporating play areas into open spaces of housing developments which are "equipped to satisfy the fundamental needs of children: the need to do something oneself, to create something" (Pedersen, 1985, p.203). Emdrup was the result of an observation made by Sorenson, noting children playing happily with the tools and materials on a construction site while ignoring organized playgrounds (Eriksen, 1985).

> In 1943, during the German occupation, the Workers Cooperative Housing Association in Emdrup built a large playground on the site of a housing development. The architect, Dan Fink, worked with Sorenson himself. Children were given large amounts of discarded building materials and other so-called "skrammel", or junk, to create their own playground. The playground consisted of 6,000 square meters (approximately 1.5 acres) covered with grass and surrounded by two-meter-high earth banks (6 feet-6 inches) that were planted with shrubs and flowers on the sides facing the apartment buildings. There was only one entrance to the playground, primarily for security reasons. A minimum number of permanent buildings were provided - including a play hut for inclement weather, toilets, storage space, and an office for the play leader - as well as a large supply of discarded material for adventurous play. For the first fourteen years, the playground was open during the summer only. It still exists but has now become a self-governing institution and is open year-round (Eriksen 1985, p.20-21).

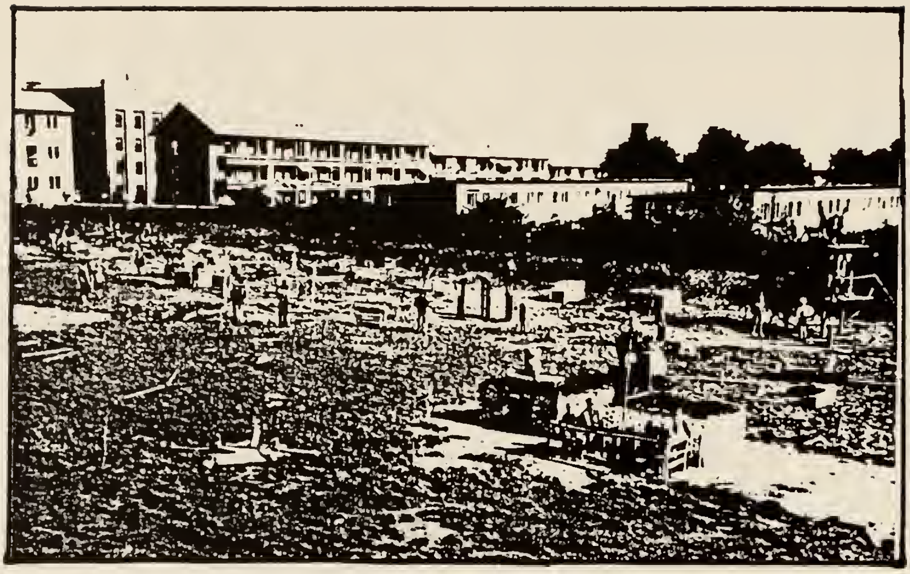


Figure 2.5 Emdrup, the first adventure playground, 1943. (Source: SBBU, Socialt Boligbyggeris Ungdomsklubber, as found in Eriksen, 1985, p.21.)

In the past 40 years the adventure playground concept has spread throughout Europe. The first adventure playground in England was established in Camberwell, London in 1948. Eriksen (1985) reported that the first Swiss adventure playground was built in Zurich in 1954. Pedersen (1985) estimated that there are currently at least 200 adventure playgrounds in Denmark.

Recent Directions in Playground Design and Research

The past twenty years have seen a renewed interest in developing new types of play environments for children and the impacts of design on children's behavior (Moore, 1985).

Frost (1985), also noting a renewed interest in play space design, stated:

> The (American playground) movement is long overdue, for the traditional American playground of concrete and steel contrasts sharply with the natural, adventure playscapes of certain other countries. True to the American tradition of diversity, the new playscapes have no common source of inspiration or theory and no singular style or design. They spring from the creative thought of professional architects, designers, educators and psychologists; and they frequently engage the energy of parents, teachers, and children.
>
> Although the reasons for the American playground movement are multiple and complex, four facets appear to be central: 1) backlash of the cognitive emphasis in early childhood education, 2) influence of European play environments, 3) increasing awareness of (safety and stimulus) deficiencies in traditional American playgrounds and 4)accumulation of experience with new types of playgrounds. In addition, research on play is contributing to the new look. (Frost, 1985 p.165).

The materials and physical layout of playgrounds have evolved over the past thirty years. During the 1950's, attempts were made to change the appearance of stark, dull traditional play equipment. Thus, new equipment was decorated with bright colors, strips, or the attachment of comic heads (Eriksen, 1985) in an effort to make playgrounds more aesthetically pleasing.

Of more significance, was a new form of play equipment designed by artists called "play sculpture". Play sculptures were constructed of a variety of materials and often took on abstract forms which did not suggest traditional playground activities. Play sculptures usually accommodated activities such as climbing, although some included activities such as sliding and crawling (Eriksen, 1985).

During the 1970's wood increasingly began to be used as a building material for playground structures. The most recent form of manufactured playground structures are the "post/deck/event" style of equipment. Jay Beckwith, a San Francisco designer, has been influential in the improvement of modern playground equipment, believing that good playground equipment should be complex, linked, flexible, challenging, developmentally relevant, safe, and durable (Frost & Sunderlin, 1985). Beckwith was the first to describe the concept of "play event" and apply it to the design of play environments. A play event is defined as that part of a play structure which provides a stimulus for a child to get to a particular location on a structure to play, such as slides, ladders, nets, suspension bridges, and other activity settings (Bruya, n.d.).

Lawrence D. Bruya considers the appearance of contemporary structures on the playgrounds of our schools and parks. He separated the decisions made by designers and others involved in designing play environments into three categories:

(A) predesign considerations
    1) human factors
    2) safety
    3) materials

(B) design considerations
  1) play event
  2) accessibility
  3) linking
  4) modular concept
(C) post design considerations
  1) trained play leaders

(Bruya, n.d.)

Moore (1985) identified two architects, Friedberg (1970, 1975), and Dattner (1969), as early fore-runners in the present ideology of design of children's play environments. Their designs and writings have led to new important ideas and much criticism. In his inner city play parks Paul Friedberg (1970) advocated "linked play", and "interplay" which includes all age groups including adults and the elderly. He believed that linked play, through juxtaposition of different play elements, would lead to greater choice and more enrichment in the learning experience. Richard Dattner (1969) combined an awareness of play as a child's developmental need and possibilities for interaction with natural elements such as sand and water. The major criticisms of these designers are that their design processes were intuitive and they made no provisions for post-occupancy evaluations (Moore, 1985).

In 1968, architect Leland Shaw was commissioned to design a play environment for physically disabled children.

The resulting facility was the Environmental Therapy Complex (ETC) at Forrest Park in Orlando, Florida. The ETC is significant for two reasons: (a)it represented a quantum leap forward in the thinking about free play as physical therapy for physically handicapped children, and (b) it is a physical representation of much of the modern theory for play environment design. Shaw (1987) stated that his design concepts for the ETC were intuitive, but have subsequently been tested in a series of research efforts and other playground designs for a variety of populations of children - physically disabled, mentally retarded (profound and trainable), emotionally disturbed, and normally developing. His design guidelines included responding to context in order to create a play environment with a sense of place. He advocated creating a unified environment linked by a series of vertical and horizontal paths around a central open space. Providing spaces for interaction with other children and the environment are more important than providing equipment. The parts of the playground should be layered vertically to maximize verbal, visual, and physical contact among children. Shaw advocated provision of loose parts for children to manipulate and discover in their own fashion.

An important term in the design of play environments is "loose parts." The term appears to have originated in a 1971 article by Simon Nicholson, "How Not to Cheat Children: The

Theory of Loose Parts," which spoke of children's need and desire for manipulatable parts:

> There is evidence that all children love to interact with variables, such as materials and shapes; physical phenomena such as electricity , magnetism, and gravity; media such as gases and fluids; sounds music and motion; chemical interactions; cooking and fire; and other people, animals, plants , words, concepts, and ideas. With all these things all children love to play, experiment, discover and invent, and have fun . . . in any environment. Both the degree of inventiveness and creativity, and the possibility of discovery, are directly proportional to the number of variables within it. (Nicholson 1971, p.)

Referring to Nicholson' Theory of Loose Parts, Shaw (1987) stated,

> Since its publication, play researchers and designers have been using the term to include anything that was not nailed, glued, or bolted in place. To this extent, the original meaning of the term has been bastardized. Nonetheless, I find the broader definition of the term a useful one . . ." (p.205).

Another direction that environmental design has taken is to include users as participating partners in design processes. Environments which are the result of participatory design have advantages of greater community acceptance and commitment as evidenced in greater use, less misuse, and less vandalism.

Claire Cooper Marcus (1975) has been an advocate for providing play areas within housing areas which are accessible to children and appropriate for a variety of age and skill levels. She also argues for including children as participating partners in the process of play space design:

> . . . continuing rigid, domineering mastery of children's environments by adults is socially destructive. It warps children at crucial stages in their growth; it reinforces less admirable traits in adults themselves. Kids ought to have a say in designing and managing their world. Look and listen at the source . . . (p.)

Bob Leathers, an architect in New York, has chosen to "look and listen at the source". Leathers has developed a process for designing unique play environments which directly involves children and adult members of schools and other community groups. He asks children to draw pictures and generate ideas which become the basis for a playground design. Children, parents, teachers, and other adults work together to review preliminary design work and to solicit funds for construction of the project. Ultimately, the members of a community come together to construct the playground (R. Leathers, personal communication, March 18, 1987). Leather's playground design projects are process-oriented serving to unify a community's commitment to children's play and quality play environments.

Paul Hogan (1974) has been a leader in the movement toward handmade playgrounds constructed from discarded, surplus, or inexpensive materials. Hogan emphasizes the importance of actively involving adults and children of the community in the process of planning, construction, and maintenance of the playground. Eriksen (1985) suggested that the proliferation of handmade playgrounds has brought playgrounds to many children who might not have otherwise had access to an organized play environment.

TYPES OF PLAYGROUNDS

Johnson and others (1987) have described three fairly distinct types of playgrounds: (a) the traditional playground, (b) the contemporary playground, and (c) the adventure playground. Frost (1985) makes a further distinction of playground types by separating contemporary playgrounds into classifications of designer's playgrounds and creative playgrounds. The distinguishing characteristics of these subcategories will be described in the contemporary playground description.

Traditional playgrounds

Traditional playgrounds are characterized by large open areas with compacted soil, turf, or asphalt play surfaces. The equipment tends to be isolated, single function steel structures such as slides, swings, jungle gyms, monkey bars, teeter totters, and merry-go rounds. The primary focus of the activities is large motor exercise. Rutledge (1971) suggested that isolating the playground structures from one another limits the potential for continuous play experiences. This type of playground has its roots in early 1900's playgrounds and recreation areas, and remains as the most common type of playground in the United States (Frost & Klein, 1979).

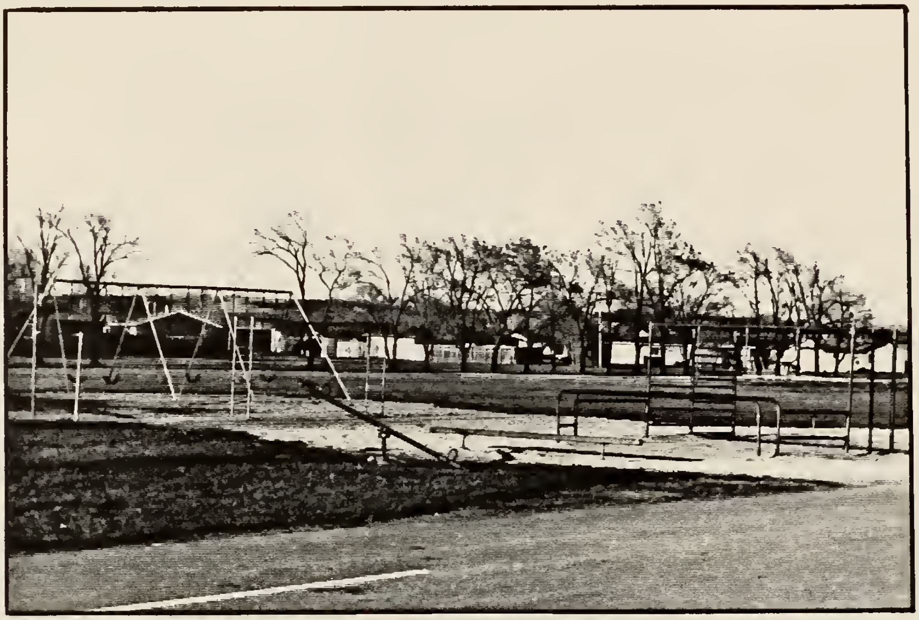


Figure 2.6 Traditional Playground at Northview Elementary School, Manhattan, Kansas.

Studies have shown that, given a choice, children prefer playing in the street to playing on traditional playgrounds (Johnson et al., 1987). A study conducted in New York City found traditional playgrounds to be vacant at least 88% of the peak play time. The study went on to report that children who did attend the playgrounds only stayed an average of 21 minutes (Hayward, Rothenburg, & Beasley, 1974). There appears to be little to spark the imagination of the child on traditional playgrounds.

Campbell and Frost (1985) reported significant differences in the functional and sociodramatic play of children in traditional and contemporary playground settings suggesting that most of the play activity on traditional playgrounds takes the form of large motor exercises. They reported that functional play (simple repetitive actions) was the most common type of play in both playground settings, however functional play made up 77.9% of the play activity on the traditional playground as opposed to 43.7% on the contemporary playground. They reported even more significant differences in the occurrence of sociodramatic play (situational role playing) on the two playgrounds: 2.0% on the traditional playground as opposed to 37.0% on the contemporary playground. The social level of play, as measured by Parten's (1932) categories of social play, also tends to be low on traditional playgrounds (Johnson et al., 1987).

Contemporary Playgrounds

Contemporary playgrounds are generally constructed of wood with selected metal fixtures. The play surface beneath the structures is generally a loose material, such as sand or bark mulch, to absorb some of the impact of a fall. The play structures, rather than being isolated and independent as is the case in traditional playgrounds, are clustered or centralized and linked by a variety of paths. Equipment found in this type of playground may include: climbing structures, observation platforms, defined spaces for sociodramatic play, suspension bridges, cargo nets, tire swings, balance beams, tunnels, and slides (Johnson et al., 1987). Sand boxes, grass areas, ponds, and gardens may also be included to expose children to a variety of natural elements (Johnson et al., 1987). Rutledge (1971) suggested that organizing and linking play structures offers opportunities for play experience continuity. In general, contemporary playgrounds offer a much greater variety of play experiences than do traditional playgrounds (Johnson et al., 1987).

Frost (1985) identified two subcategories of contemporary playgrounds worthy of mention:

> The Designer's Playground. A formal playground created by a professional architect or designer, usually of high esthetic quality, with variable function equipment and linked play zones. The equipment is frequently a mix of expensive commercial wood sculpture, metal apparatus and an assortment of timbers (eg. railroad ties); natural stone and concrete are used for terraces and climbing.
>
> The Creative Playground. A semi-formal playground constructed creatively from existing commercial equipment, purchased or gift equipment and an infinite range of scrounged materials (eg. tires, lumber, telephone poles, railroad ties, cable spools, scrap pipe). Frequently planned and constructed by parents, teachers, and children utilizing the help of a playground specialist, it includes permanent equipment, sand and water, and an array of loose parts to accommodate all forms of play. Areas for special activities such as art, gardening and caring for animals are frequently included. (p.168)

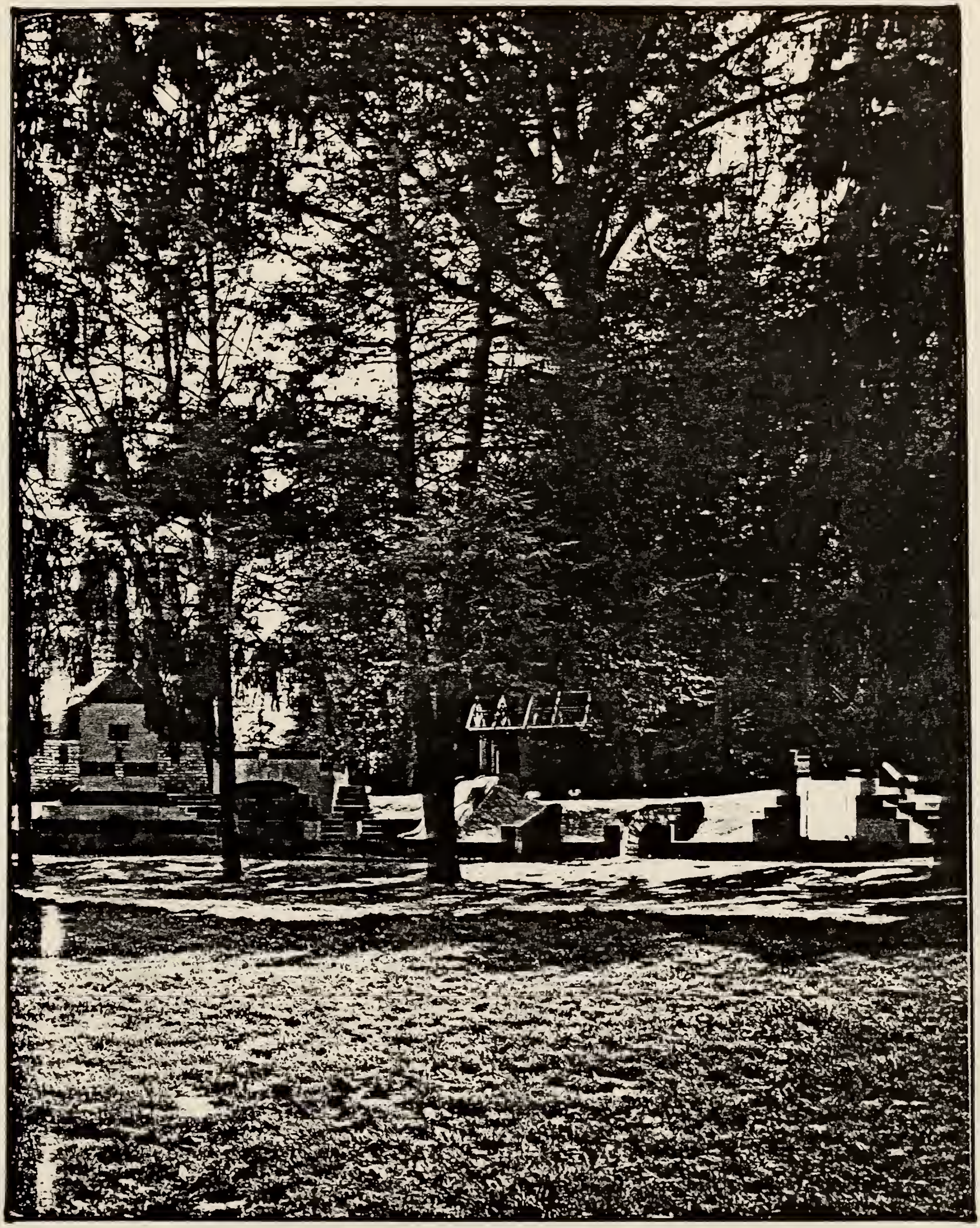


Figure 2.7 "Designer's Playground" - Ritter Park Playground, Huntington, West Virginia. Architects and Planners: Bohlin and Powell Larkin Cywinski Source; "The Eyes of a Child," **Landscape Architecture**, January/February 1987, pp 84-89.

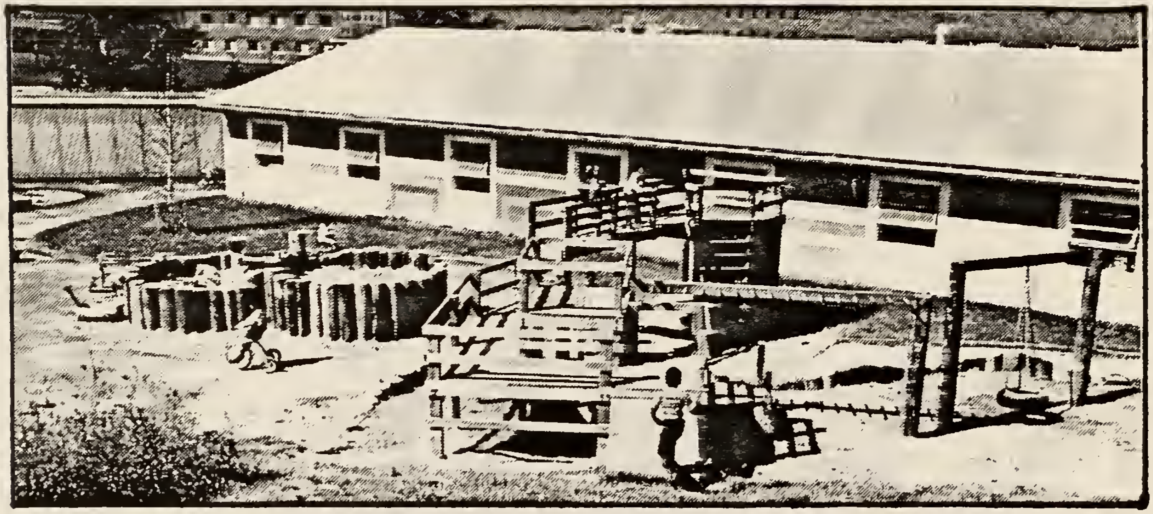


Figure 2.8 "Creative Playground" - Syracuse University Early Childhood Education Center playground, Syracuse , New York. Designed and constructed by the students and faculty of the Third Year Design Class at the School of Landscape Architecture, College of Environmental Science and Forestry, State University of New York, Syracuse. Source: Hogan, Paul. (1974). **Playgrounds for Free**. Cambridge, Massachusetts: The MIT Press, pp. 231.

Little research has been conducted to determine the effects of contemporary playgrounds on children's play patterns (Johnson et al., 1987). Campbell and Frost (1985) reported higher levels of constructive play (creation from raw materials) and sociodramatic play on a contemporary playground compared to a traditional playground. Hayward and others (1974) reported greater, longer, and more varied use by children on contemporary playgrounds as opposed to traditional playgrounds.

Adventure Playgrounds

Adventure playgrounds, junk playgrounds, or Robinson Crusoe playgrounds are natural areas supplied with a variety of tools and discarded building materials for children to manipulate, such as lumber, crates, rope, cable reels, hammers, nails, saws (Johnson et al. 1987). Often opportunities for gardening and caring for animals are provided. The playgrounds are screened from outside views by fences, vegetation, earth mounds, or a combination of these elements. Children are permitted and encouraged to become involved in a wide variety of activities, including building, tearing down, making fires, cooking, digging, playing with water, and mud sliding (Johnson et al., 1987).

A notable feature of adventure playgrounds is the presence of at least one trained play leader on each site. The play leader acts as a supervisor and offers assistance and advice to the children only on an as-needed basis. In Denmark play leaders are trained in teachers colleges. The training program emphasizes an understanding of child development and play, art and crafts skills, engineering and structural knowledge, and administrative techniques (Eriksen, 1985).

The first adventure playground in the United States was established as a demonstration playground in Minneapolis, Minnesota in 1950. By 1977 there were 20 adventure playgrounds in twenty U.S. cities in eight states (Eriksen, 1985). There are a number of factors which limit the acceptance of adventure playgrounds by parents and civic leaders in the U.S.: (a) funding and education are not available for play leaders required by adventure playgrounds, (b) there is a mistaken belief that adventure playgrounds are dangerous, though studies have proven them to be safer play environments than traditional playgrounds, (c) adventure playgrounds are unsightly, and (d) parents in lower socioeconomic neighborhoods are insulted when adventure, or "junk", playgrounds are placed into their neighborhoods (Eriksen, 1985).

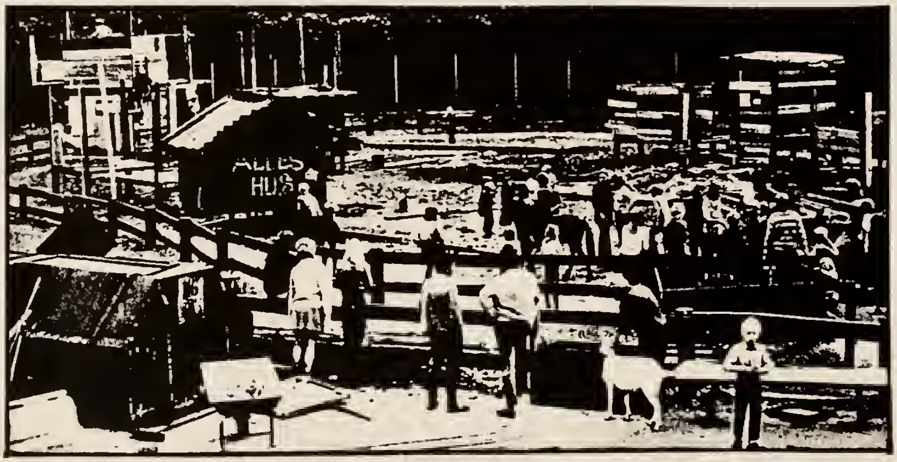


Figure 2.9 Adventure playground - SBBU, Socialt Boligbyggeris Ungdomsklubber (Source: Eriksen, 1985 p.25)

Hayward and others (1974) reported higher levels of use on adventure playgrounds than on either their contemporary or traditional counterparts. This study also indicated greater involvement of adults with children on adventure playgrounds. In a study of adventure playgrounds in London, Cooper (1970) reported two benefits to the community: reduction in vandalism and greater community involvement. Moore (1985) suggested:

> the greater incidence of cognitive, cognitive-social, cognitive-motor and cooperative play activities (found on adventure playgrounds by himself and others) is related to the character of the physical settings and in particular, the quantity of loose parts available" (Moore, 1985 p.175).

Conclusions

It is generally accepted that children progress through a relatively predictable sequence of developmental stages. Initially children identify themselves as separate entities from the rest of their environment, learn that objects exist even when they are hidden from view, learn to manipulate concrete objects, and ultimately learn to manipulate abstract concepts. Children's environments are testing grounds in which adaptation and development of their cognitive structures occur. Through ongoing processes of assimilation and accomodation, children mature toward an increasingly specialized understanding of the world and their places within it. Play is one of the primary vehicles through which child/environment interactions occur. Children at play have the opportunity to act as agents of change in the environment, try on a variety of roles, and generate a variety of solutions to problems which they have defined for themselves. One might propose that a relationship exists between the quality of a play environment, as measured by multi-sensory opportunities for child/environment interaction, and all facets of children's development.

State regulations of 36 out of the 50 states require licensed child care providers to provide for a daily period of outdoor play. The National Association for the Education of Young Children (NAEYC) (1984) accreditation criteria provide a national set of standards by which early childhood education programs are reviewed for quality. The section providing guidelines for review of physical environments stated:

> The indoor and outdoor environments are safe, clean, attractive, and spacious. There is . . . a minimum of 75 square feet of play space outdoors per child.
>
> Activity areas are defined clearly by spatial arrangement. Space is arranged so that children can work individually, together in small groups, or in a large group. Space is arranged to provide clear pathways for children to move from one area to another and to minimize distractions.
>
> Age-appropriate materials and equipment of sufficient quantity, variety, and durability are readily accessible to children and arranged on low, open shelves to promote independent use by children.

> Private areas are available indoors and outdoors for children to have solitude.
>
> The outdoor area includes a variety of surfaces such as soil, sand, grass, hills, flat sections, and hard areas for wheel toys. The outdoor area includes shade; open space; digging space; and a variety of equipment for riding, climbing, balancing, and individual play. The outdoor area is protected from access to streets or their dangers. (NAEYC, 1984, p.25-26)

Notable among these guidelines is a recognition that children need opportunities to play in a variety of social settings ranging from solitary play to large group interactive play.

The Kansas Department of Health and Environment (KDH&E) (1986) is responsible for regulating and licensing preschools and child care centers. Regulations stated that children must have at least one period of supervised outdoor play each day as weather permits. The section of the regulations concerning the outside physical environment stated:

> There shall be at least 75 square feet of outdoor play space on the premises for each child using the space at a given time.
>
> The boundaries of outdoor play space shall be enclosed with a fence not less than four feet high.
>
> The outdoor play space shall be located to provide both sunshine and shade. A hard surfaced area or gravel shall not be used under anchored play equipment.
>
> The outdoor play space shall be well drained and free of hazards.
>
> Outdoor play equipment shall be safely constructed and in good repair. . .

> The play area shall be arranged so that staff can provide close supervision at all times.
>
> Outdoor equipment shall be provided in sufficient quantity so that each child has access to at least one activity appropriate to the child's age level. (KDH&E, 1986, p.30)

As evidenced in these regulations, it is a relatively simple matter to develop objective guidelines for the physical size of and safety of outdoor play environments. However, developing objective criteria for assessing the play "value" of play equipment and activity settings is more difficult. Factors which may be used to determine play value of equipment and settings include: (a) degree to which various types of social interaction are stimulated and supported, (b) degree to which physical activities are stimulated and supported, (c) degree to which constructive activities are stimulated and supported, (d) provisions for multiple activities versus a single function, (e) ratio between monetary cost versus play benefit, and (f) children's willingness and desire to become involved in an activity.

Environmental designers have been charged with creating outdoor spaces for recreation and play since the late 19th century, as evidenced by Frederick Law Olmsted's design for Charlesbank Playground constructed in Boston from 1889-91. However, it is probably a safe generalization that most play environments have been designed on the basis of intuition and experience rather than objective guidelines. There has been little post-occupancy evaluation of play environments to document the effect that design has on children's behavior. Claire Cooper Marcus (1986) suggested that most designers, like other adults, seem to have virtual amnesia about the qualities of their own favorite play environments. This, in combination with a lack of understanding of child development theory, suggests that the environmental design professions may be failing to provide the kinds of play experiences children need in a rapidly urbanizing society. Environmental designers may be skilled in creating environments which are aesthetically pleasing, safe and functional. However, these environments stand in stark contrast to adventure playgrounds, in which the processes of construction and interactions with peers outweigh the importance of the visual quality of the final product. A goal for research in the area of play environment design should be generating objective guidelines for developmentally appropriate settings for child/environment interaction which can be practically applied by environmental design practitioners.

Children are a unique user group in that they generally have little or no say about the design of environments for their use. Because of their developmentally immature thought processes, children, especially preschool children, may not be able to make the kind of value judgements necessary to wholistically design a play environment. However, their uninhibited creativity and direct involvement in play suggest that childen should be included as active partners in design processes. Therefore, it is up to researchers and practitioners to develop methods which allow and encourage children to participate in design processes. Secondly, design methods and resulting designed environmental settings should be evaluated to determine the effectiveness and accuracy with which they were able to accomodate the needs and desires of children.

CHAPTER 3

METHOD AND PROCEDURE

The purpose of this chapter is to describe the research intent, subject pool, study sites, and data collection methods employed in this research project. The first section outlines the research intent of this study. The following section provides definitions for terms used in this study. The subject pool and study sites are described in the next section. The final section of this chapter describes the data collection procedures.

RESEARCH INTENT

In an effort to address the need for generating objective measures of play value the objectives of this research project were to gain an understanding of where and how children play in the outdoor environment of a child care center. This research will examine play units employing two of the factors which may be used to measure play value.

A. One measure of play value is to observe children's willingness and desire to become involved with a play unit.

If children exhibit preference for various play equipment and activity settings, measurable as frequency of use:

1. How does the relative frequency of use of play units vary?
2. How does does the type of playground setting, traditional or contemporary, appear to impact the relative frequency of use exhibited by children?

B. A second measure of the play value is to observe the types of social interaction which are stimulated and supported by a play unit. Therefore, if children exhibit preference for some play units and are involved in various categories of social play:

1. How does the type of social interaction vary by play unit?
2. What are the relationships between categories of social play and play units?
3. How does playground type, traditional or contemporary, impact social interaction?

DEFINITIONS

The study sites for this research project had characteristics of traditional and contemporary playgrounds. The type of equipment and the spatial relationships between equipment and activity settings were used to classify playgrounds. The equipment in **traditional playgrounds** tends to be isolated, single-function steel structures with a primary focus of large motor exercise. Slides, swings, and jungle gyms are examples of traditional types of playground equipment. The equipment and play spaces in **contemporary playgrounds** tend to be clustered or centralized and linked by a variety of paths which increase opportunities for social interaction. Suspension bridges, observation decks, cargo nets, tunnels, and tire swings are examples of contemporary types of play equipment.

Kritchevsky, Prescott, and Walling (1977) described a play unit as containing something with which to play. The term **play unit**, defined in this way, can be used to describe a wide range of play settings from a piece of traditional play equipment to a space for socio-dramatic play. A potential play unit is a flexible open space with physical or visible boundaries to which play material may be added (Kritchevsky et al., 1977). This research project focused on describing the frequency of use of play units (i.e. play equipment and activity settings), therefore data were not collected regarding the use patterns of the open spaces on the study sites.

Social categories of play as defined by Mildred Parten (1932) were used to describe the level of social interaction in which children were involved. Because associative and cooperative categories of play are difficult to distinguish, they were combined into a single category of interactive play. An additional category was added to describe instances when a child was talking with or being reprimanded by a teacher. The following is a brief description of the social categories used in this study to describe children's behavior:

> Unoccupied: The child did not appear to be actively involved in a play activity.

> Onlooker: The child exhibited an active interest in the play of other children, but did not join in the play activity.

> Solitary: The child played alone and independently with objects different from other children around. The child did not verbally communicate with other children. Although the children were involved in similar activities, two children swinging adjacent to one another were coded as involved in solitary play unless there was an indication that the children acknowledged the activity of the other.

> Parallel: The child was playing in close proximity and in a similar manner to at least one other child. The children did not verbally communicate with one another.

Interactive: The child was involved in a play activity which included social interaction and verbal communication with other children.

Teacher: The child was involved in some form of verbal communication with an adult.

METHOD

Selection of Subject Groups and Test Site

The priorities in searching for a potential subject pool and test sites were (a) to identify intact groups of children which would be representative of typical child care center situations, and (b) to identify existing playgrounds which would represent a range from traditional to contemporary in design. Five already established child care programs were selected allowing a total of 108 children, 53 boys (49.1%) and 55 girls (50.9%), playing in the four playground settings to be observed in the project. The ages of the children in the subject pool ranged from 2 years-6 months to 7 years-0 months (mean age 4 years-2 months).

Subject Pool and Playground Sites

Child Care Program A

Child Care Program A is a toddler program for children from 18 months to 3 years of age. At the time of this study the program had an enrollment of 12 children, 5 boys and 7 girls, ranging in age from 1 year-10 months to 3 years-1 month (mean age 2 years-6 months).

Playground A is contemporary in design. A number of activity settings are clustered around a central climbing structure surrounded by sand. The climbing structure is a series of wooden platforms leading to a covered observation deck. During observation periods there was an average of .83 play units available per child. Play units in this playground were: (a) a concrete pipe projecting through an earth berm, (b) a wide slide down a side of the same earth berm, (c) two swings from a wooden structure, (d) a wide slide from the climbing structure into the sand area, (e) sand play area, (f) a series of platforms, a ramp, and steps for climbing, (g) a covered observation deck, (h) a concrete pad and adjacent asphalt loop with four tricycles, (i) a concrete tunnel set on top of the ground, (j) and loose parts which over the observation periods included teacher composed arrangements of movable manufactured climbing equipment, cardboard, pull toys, and open-ended metal drums.

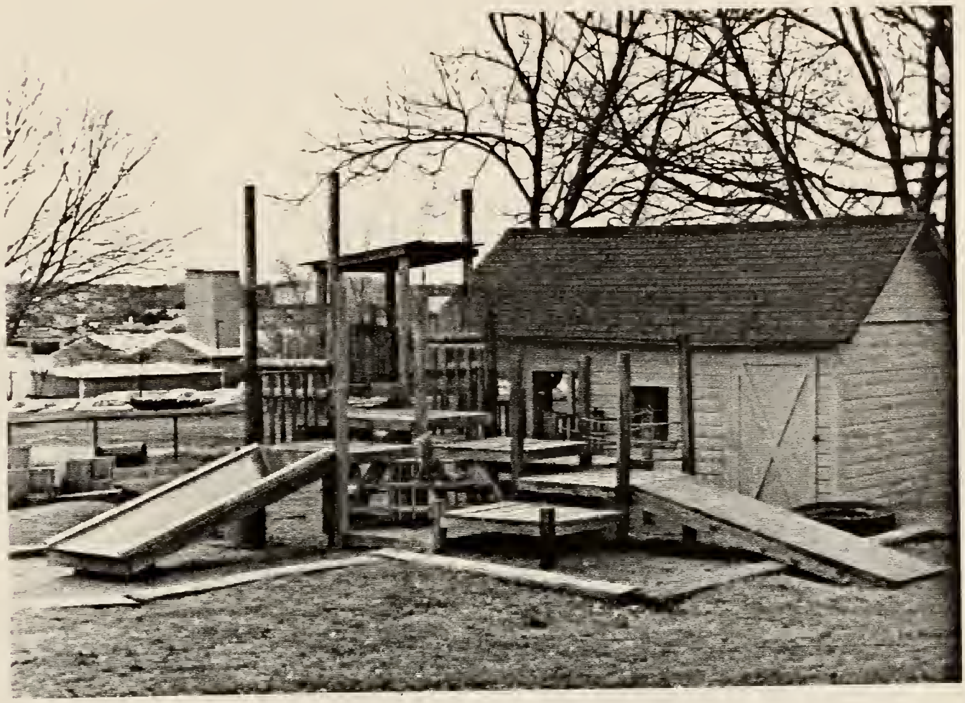


Figure 3.1 Play Structure in Playground A

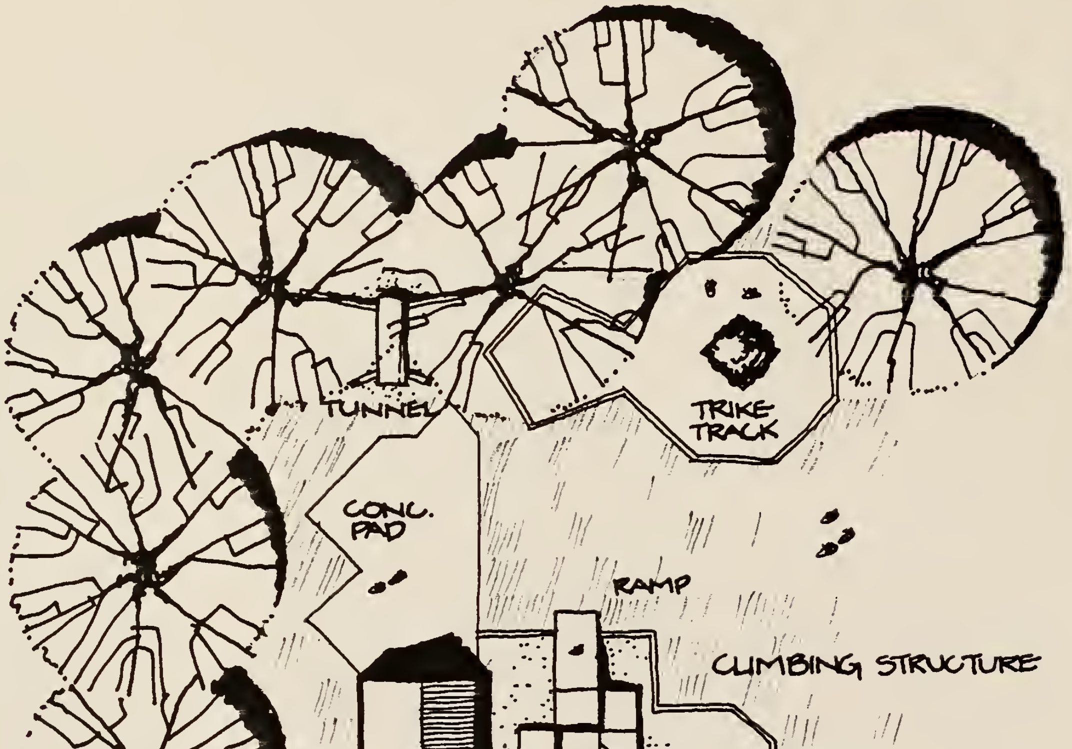
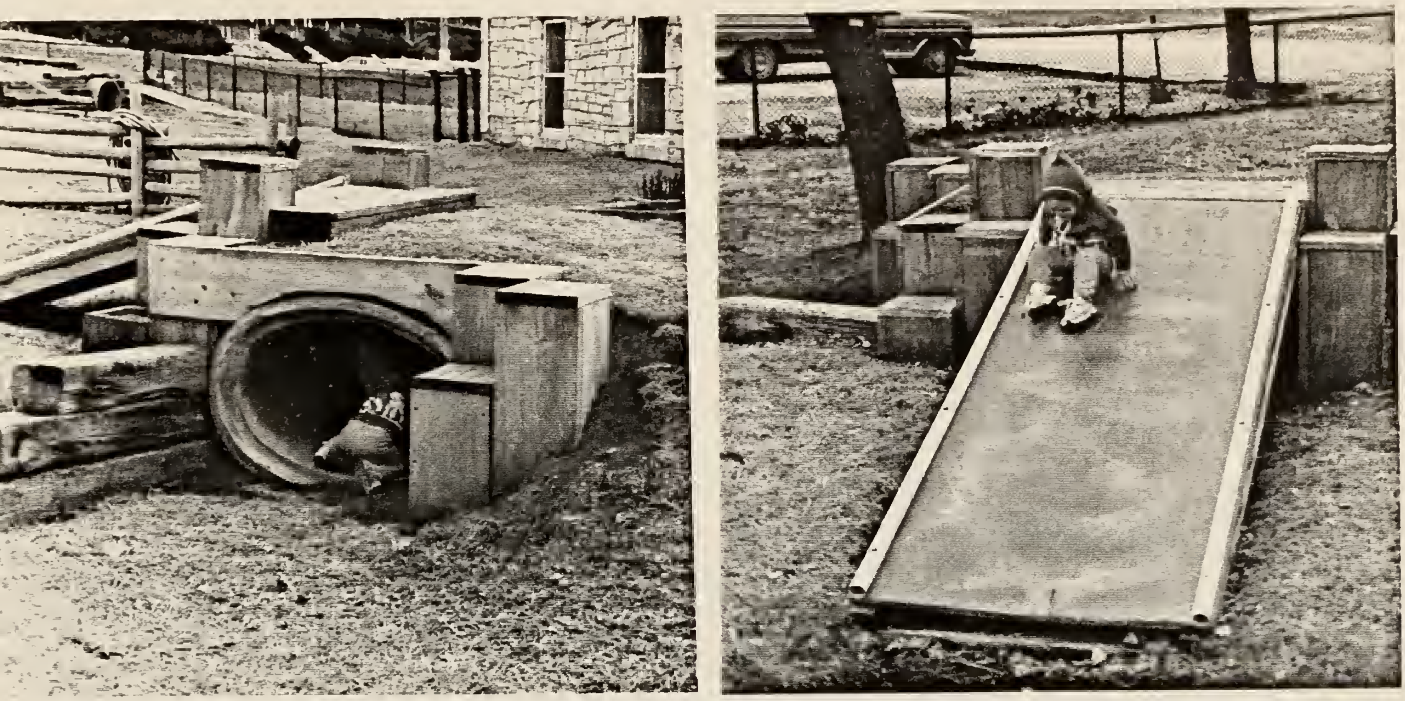


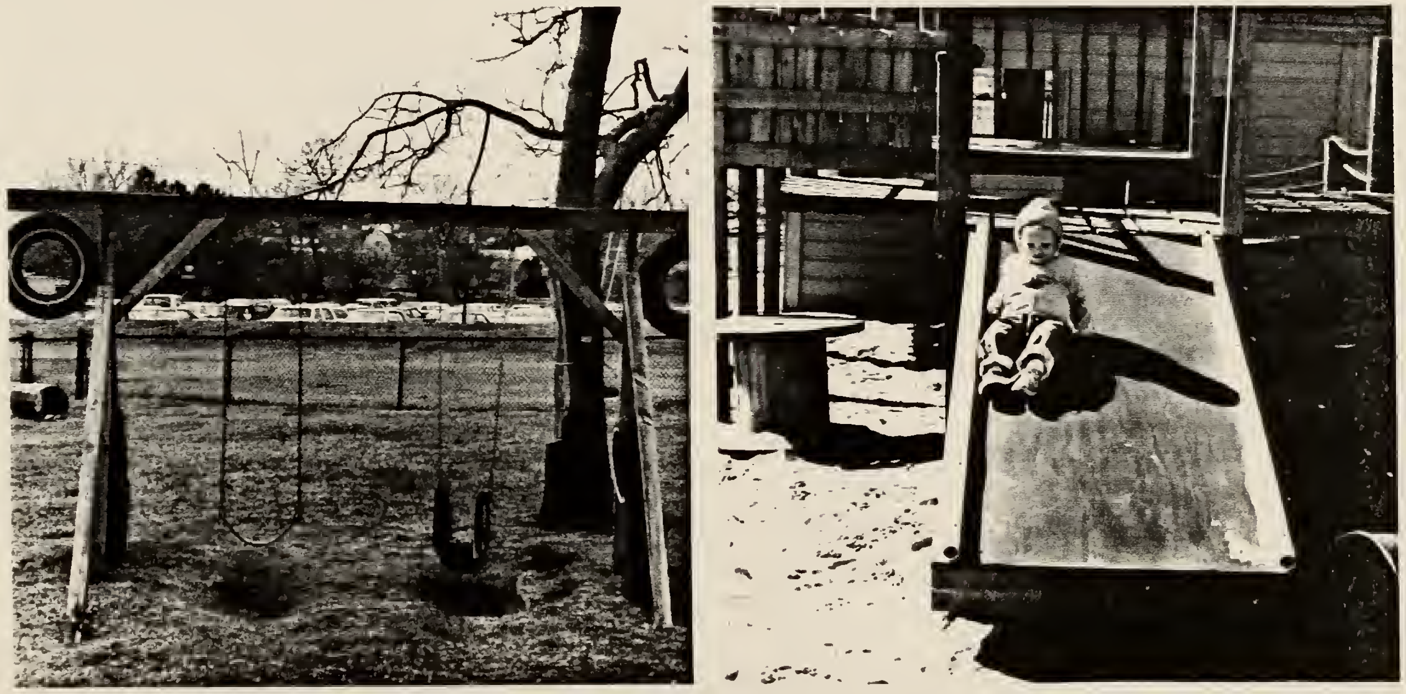
Figure 3.5 Plan drawing of Playground A

Figure 3.3 Play units in Playground A



(a) concrete tunnel in hill

(b) slide from hill



(c) two swings from structure

(d) slide from structure

(e) sand play area

(f) climbing structure

(g) observation deck

(h) tricycle track

(i) concrete tunnel on ground

(j) movable equipment

Child Care Program B

Child Care Program B is a preschool program for children ranging in age from 3 to 5 years. At the time of this study the program had an enrollment of 18 children, 10 boys and 8 girls, ranging in age from 3 years-3 months to 5 years-2 months (mean age 4 years-3 months).

The design of Playground B is contemporary. The play units are clustered around a play structure set in a sand play area. This structure is a linear series of platforms and linking suspension bridges. Of the selected study sites, this playground has the greatest number of linkage paths between play units, thus offering the greatest opportunities for continuous play. During observation periods this playground had an average of .67 play units available per child. The play units on this playground were: (a) two sand play areas, (b) a concrete loop for tricycle riding, (c) a cargo net from the climbing structure, (d) two suspension bridges, (e) a wide slide from the climbing structure, (f) a covered observation deck, (g) a single slide from the climbing structure, (h) a series of platforms, a ramp, and steps for climbing, (i) four concrete tunnels set into an earth berm radiating from a centralized play space, (j) a wide slide from the same earth berm, (k) two tire swings from a wooden structure, and (l) teacher composed arrangements of movable manufactured climbing equipment (loose parts).

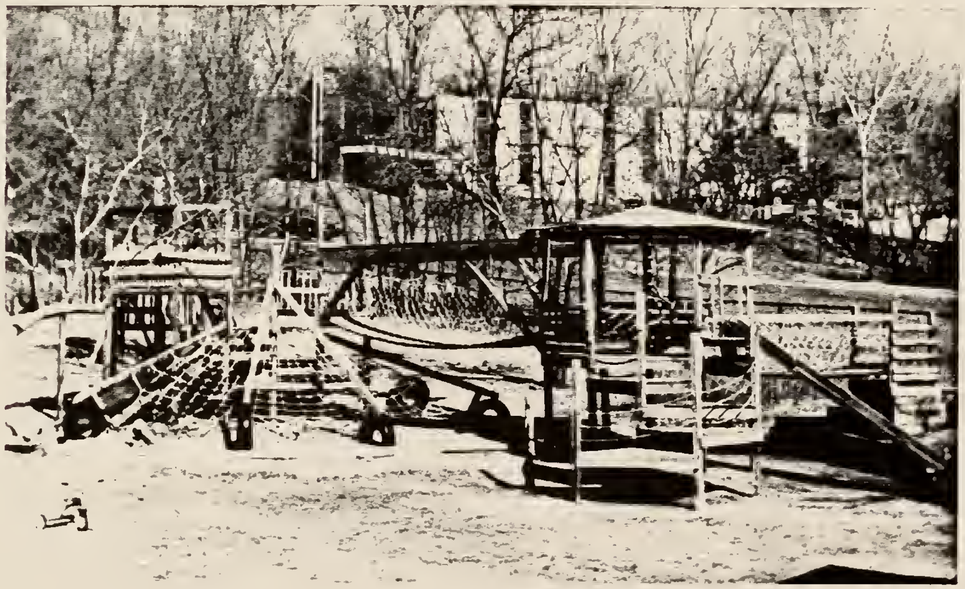


Figure 3.4 Play Structure in Playground B

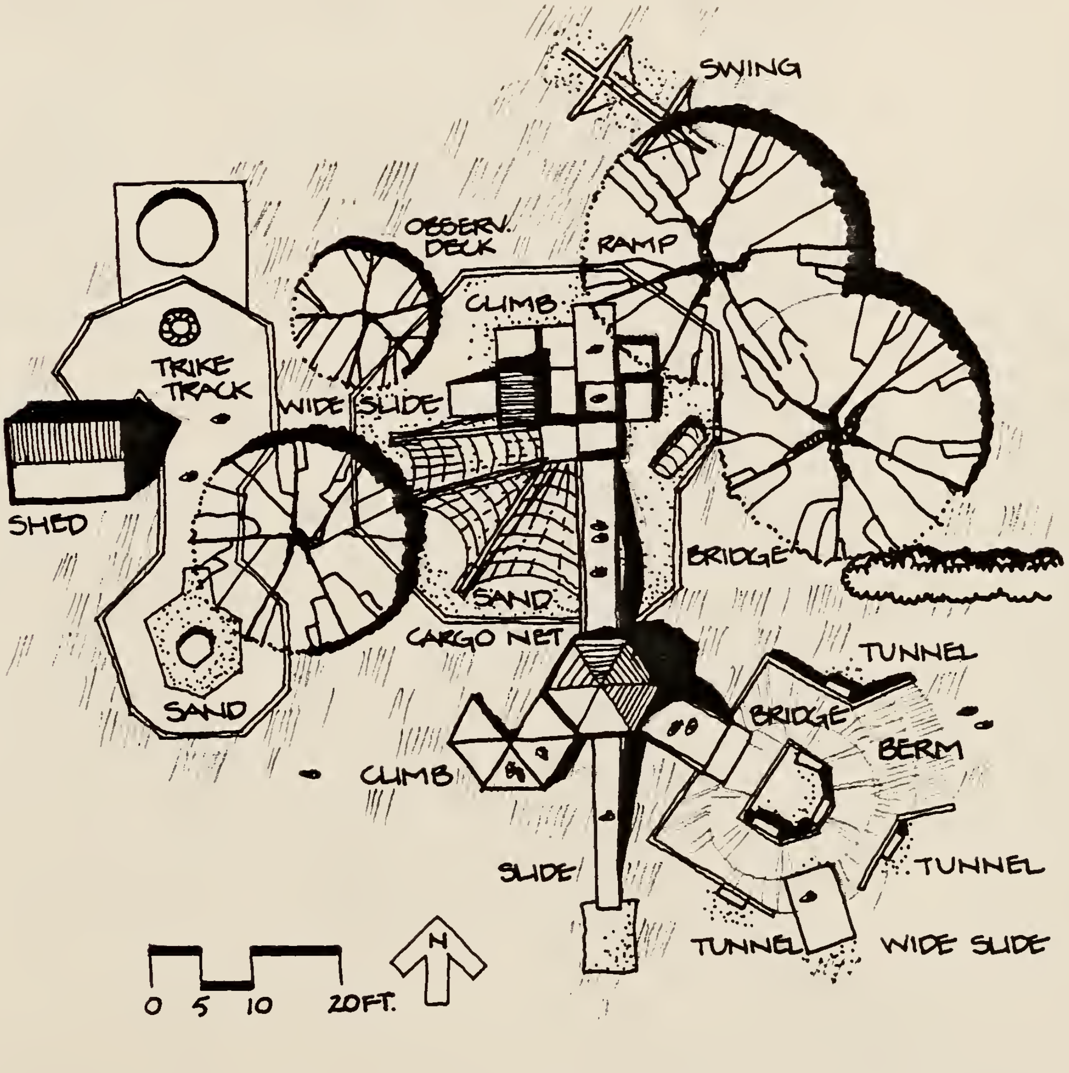
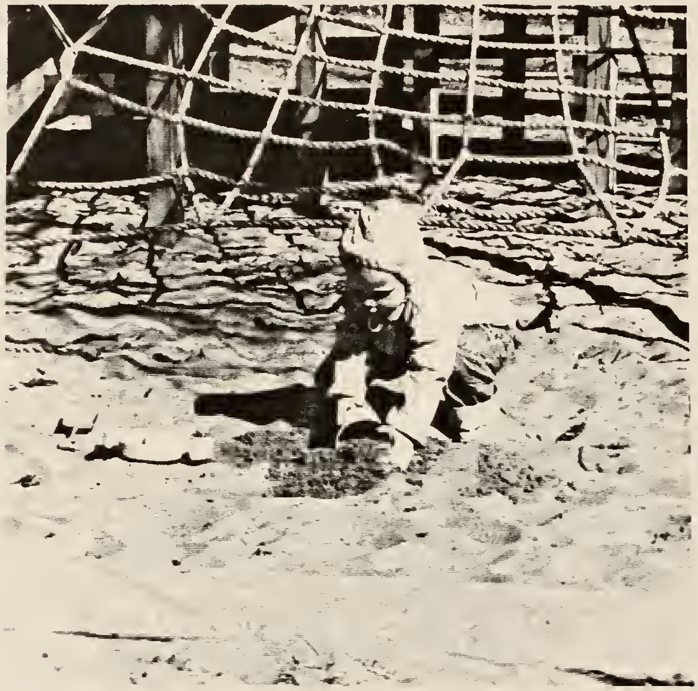


Figure 3.5 Plan drawing of Playground B

Figure 3.6 Play units in Playground B



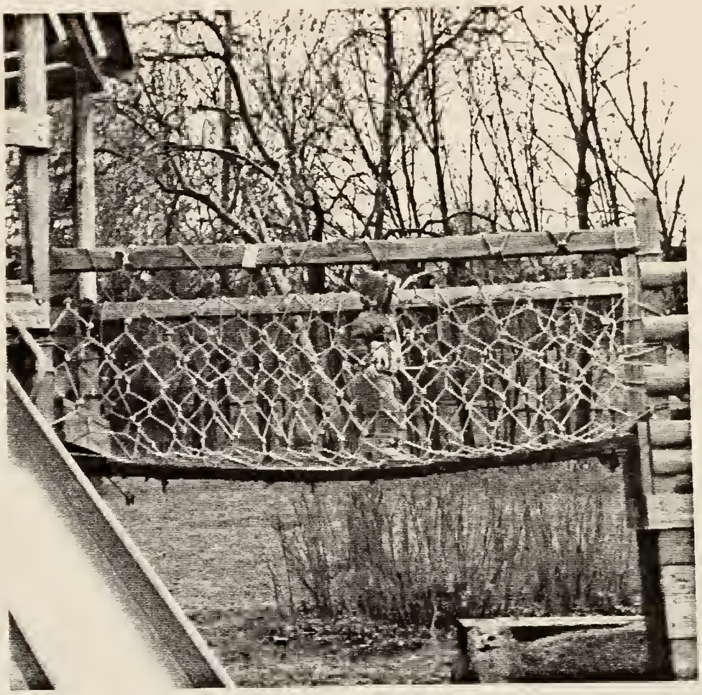
(a) sand play area 1

(b) sand play area 2

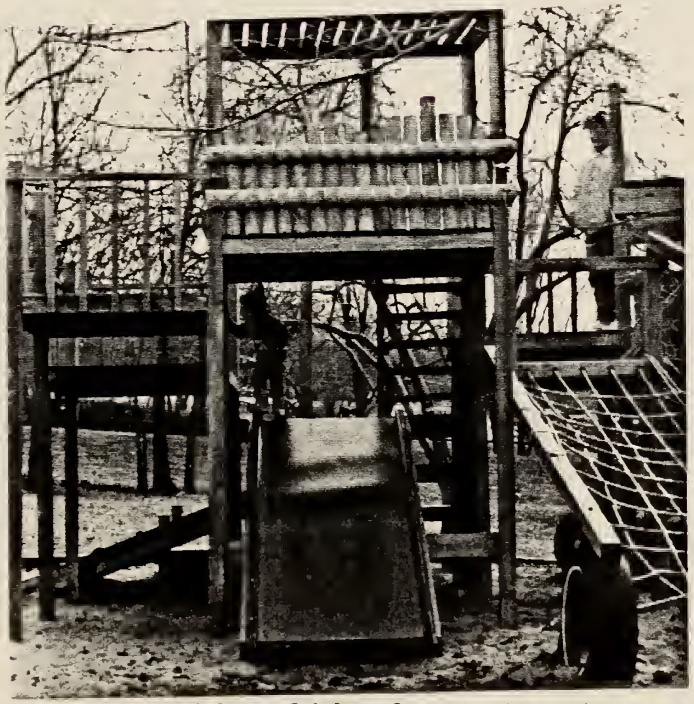
(b) tricycle track

(c) cargo net from structure

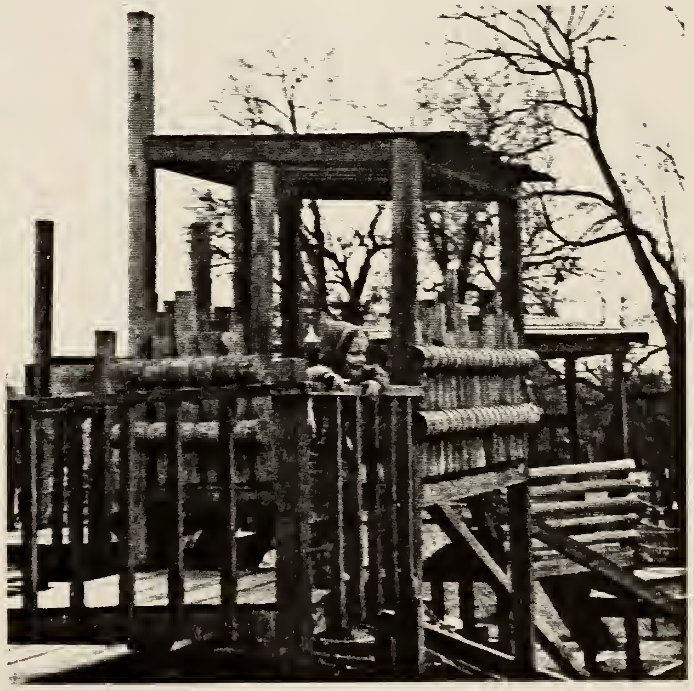
(d) suspension bridge 1



(e) suspension bridge 2



(f) wide slide from structure



(g) observation deck

(h) single slide from structure

(i) climbing platforms

(j) concrete tunnels set in berm

(k) slide set on berm

(1) moveable equipment

Child Care Program C

Child Care Program C is a preschool program for children 2-1/2 to 5 years attending on a morning-only, afternoon-only, or full day basis. Data collection sessions at this center were scheduled for afternoon periods, therefore only children enrolled on an afternoon-only basis or full day basis were included in this study. At the time of this study the afternoon program had an enrollment of 17 children, 7 boys and 10 girls, ranging in age from 3 years-6 months to 5 years-2 months (mean age 4 years-4 months).

Traditional and contemporary equipment are set in isolated positions in Playground C. Of the selected sites, the physical distance between play units is greatest in this playground. During observation periods there were an average of .65 play units available per child. Play units in this playground were: (a) a jungle gym, (b) a concrete tunnel set into an earth berm, (c) two swings from trees, (d) a series of wooden platforms and steps for climbing the play structure, (e) a single slide from the play structure, (f) a tire swing from the play structure, (g) a sand play area, (h) a concrete loop with five tricycles, (i) an observation platform with a covered space beneath, (j) a linear path defined by two stone retaining walls and earth berms, (k) teacher composed arrangements of moveable manufactured play equipment (loose parts).

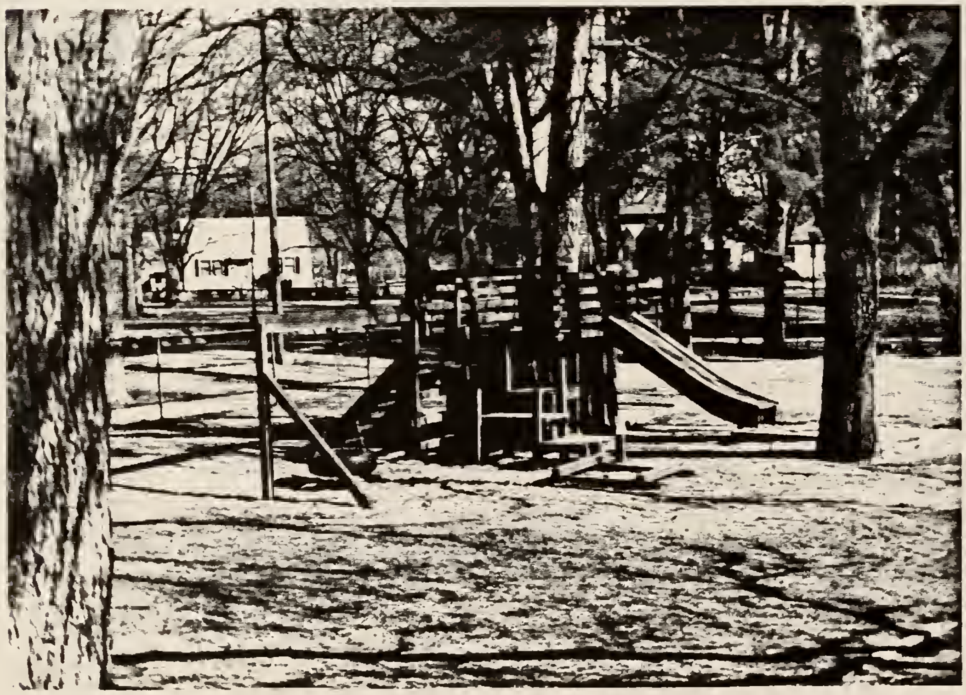


Figure 3.7 Play structure in Playground C

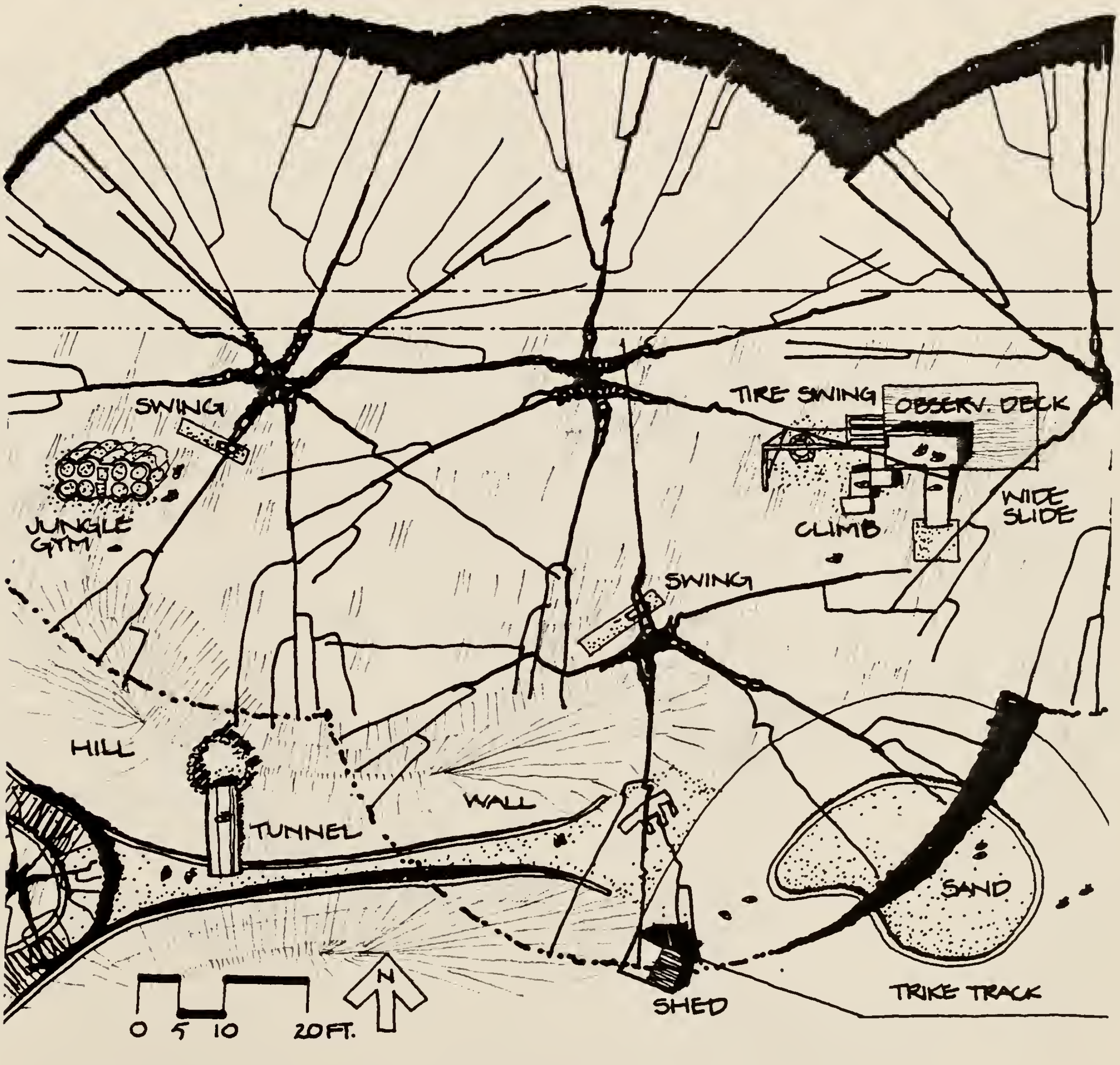
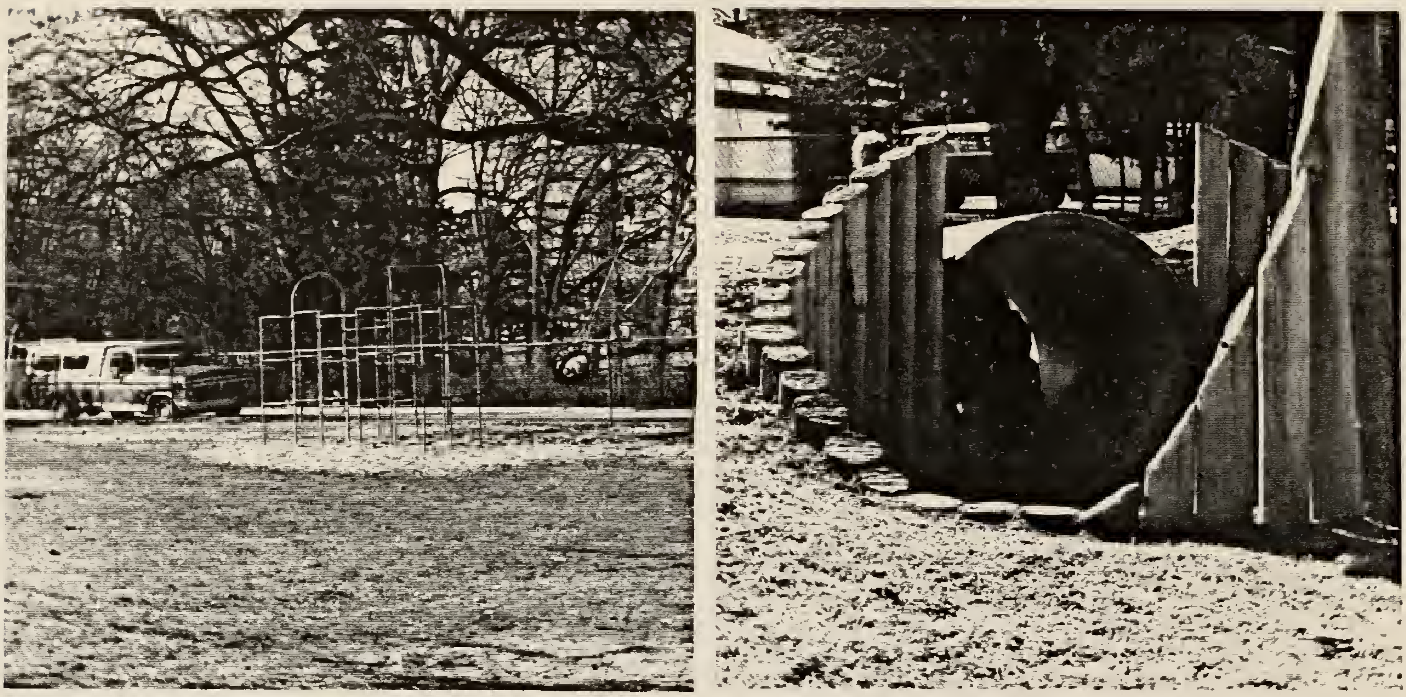


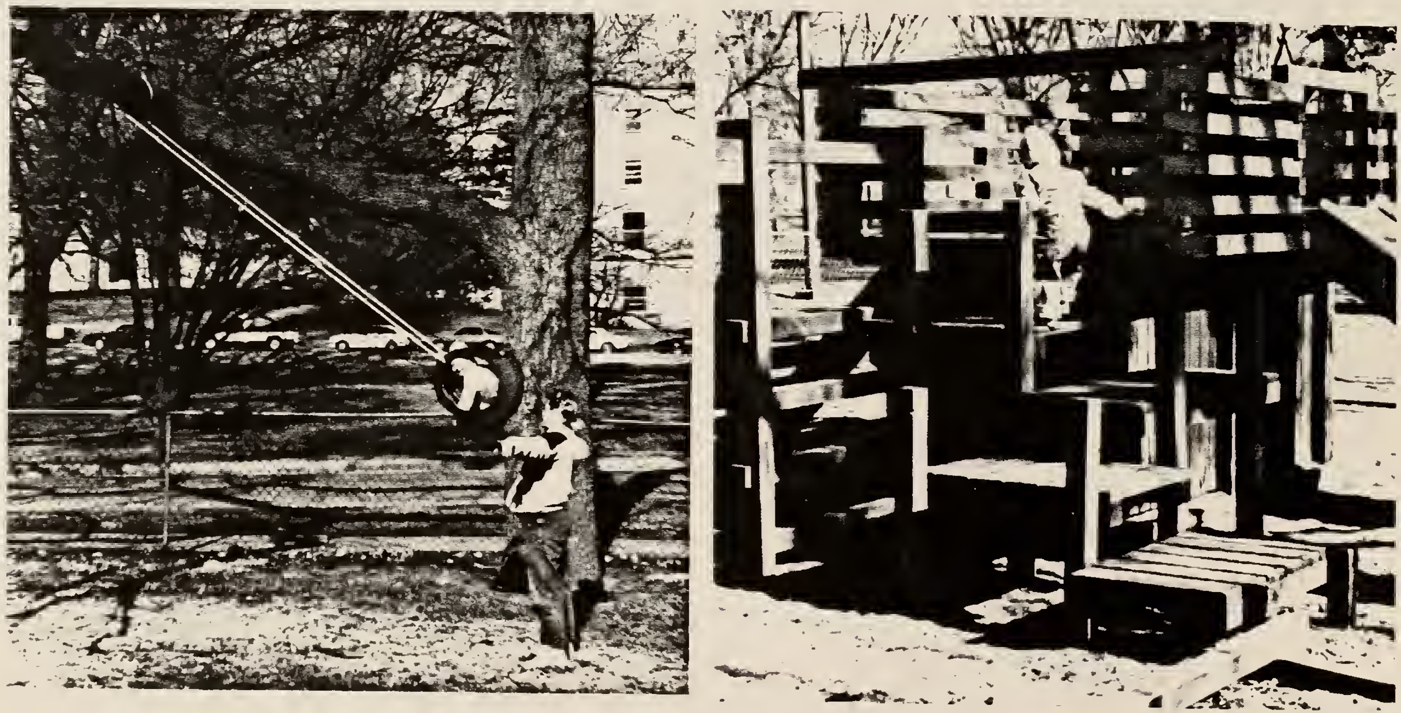
Figure 3.8 Plan drawing of Playground C

Figure 3.9 Play units in Playground C



(a) jungle gym

(b) concrete tunnel in berm



(c) swing from tree

(d) climbing
(i) observation deck

(e) slide from structure

(f) tire swing from structure

(g) sand play area
(h) tricycle track

(j) path, walls, berms

(k) loose parts

Child Care Program D, Child Care Program E

Child Care Program D is a preschool program for 3-year-old children which meets on Tuesday and Thursday mornings. At the time of this study the program had an enrollment of 23 children, 12 boys and 11 girls, ranging in age from 3 years-3 months to 4 years-2 months (mean age 3 years-10 months).

Child Care Program E is a preschool program for 4-year-old children which meets on Monday, Wednesday, and Friday mornings At the time of this study the program had an enrollment of 38 children, 19 boys and 19 girls, ranging in age from 4 years-3 months to 7 years-0 months (mean age 4 years-9 months).

Child Care Program D, and Child Care Program E meet on alternating days allowing them to utilize the same classrooms and playground. In this playground, pieces of traditional playground equipment are arranged around the perimeter of a central open space. Athough the physical space and play units are nearly the same for each group, children are an active component of any playground. Therefore, it was determined that the playground should be identified as Playground D and Playground E. Minor modifications were made to the playground for each group: (a) the children of child care program D (Playground D) were provided with "hoppity hop balls" (loose parts), and b) two rope ladders were hung in place of two swings on one of the swing set structures for use by children in child care program E (Playground E). During observation periods there were an average of .30 play units available per child in Playground D, and an average of .18 play units available per child in Playground E. Play units in Playground D and E were: (a) sand play area, (b) a jungle gym, (c) a concrete loop with nine "big wheel" tricycles, (d) five swings (Child care program D) four swings (Child care program E) (e) three slides, (f) two rope ladders (Child care program E), (g) railroad tie structures or partially buried tires used for climbing, (h) two "hoppity hop balls (loose parts) (Child care program D).

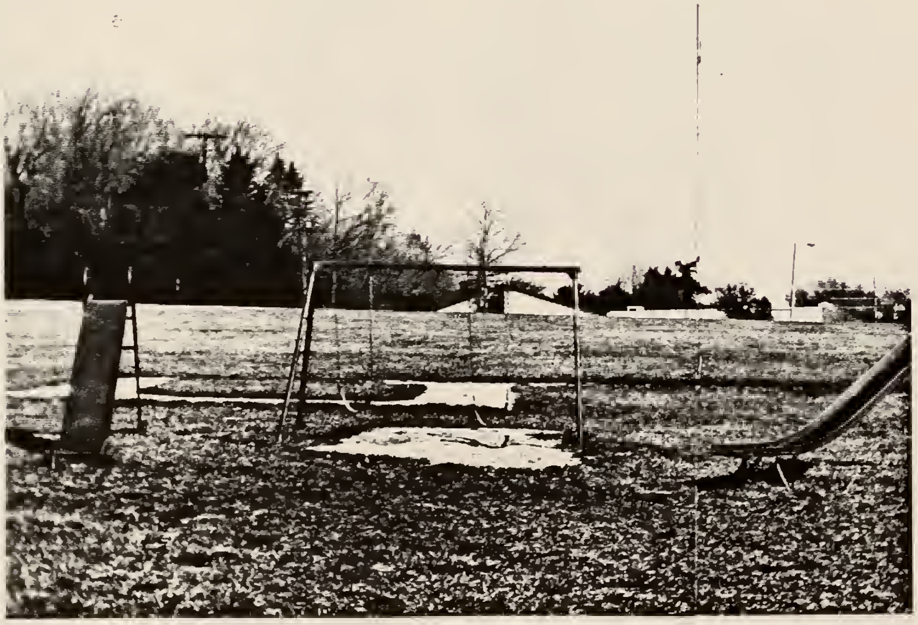


Figure 3.10 Playgrounds D and E

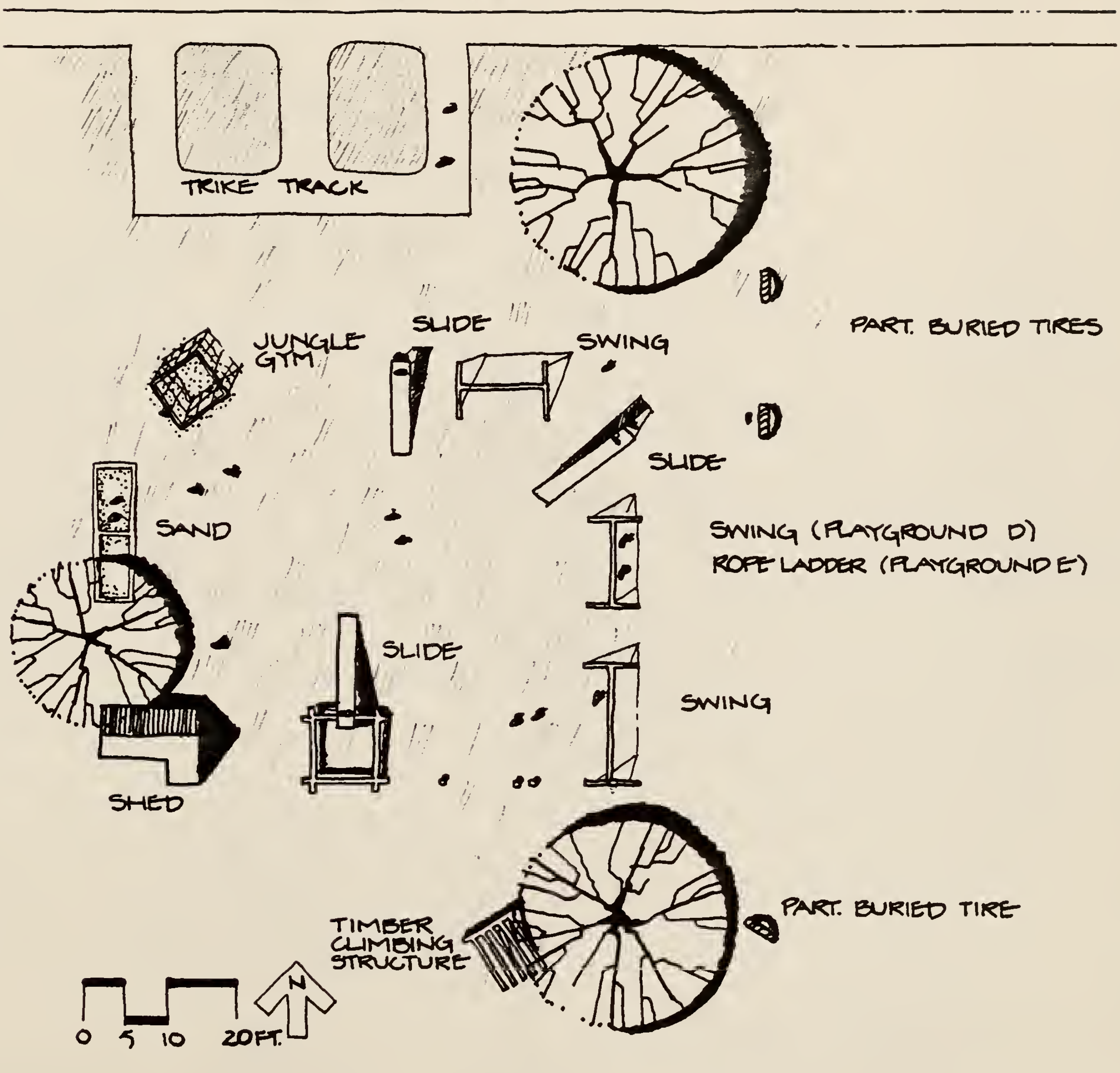
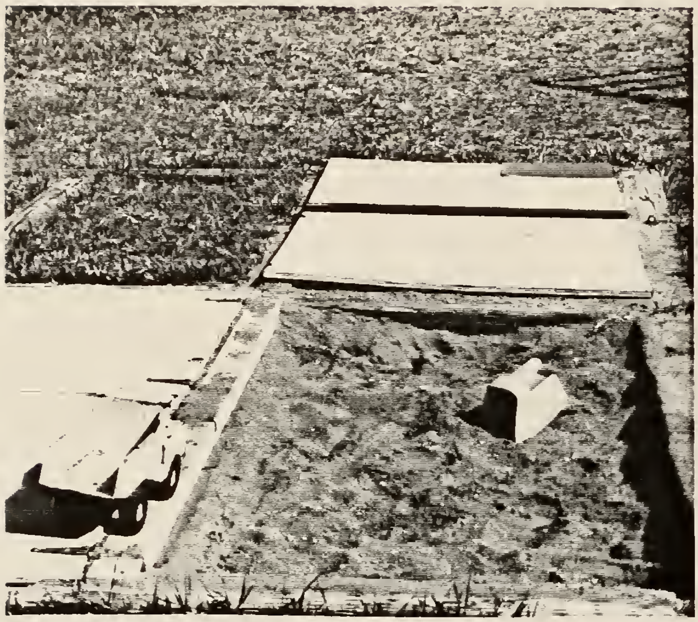
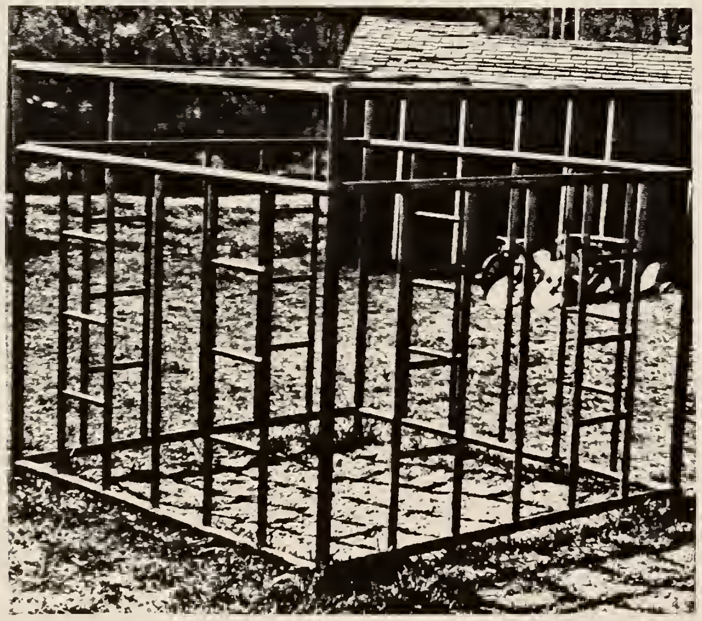


Figure 3.11 Plan drawing of Playgrounds D and E

Figure 3.12 Play units in Playgrounds D and E

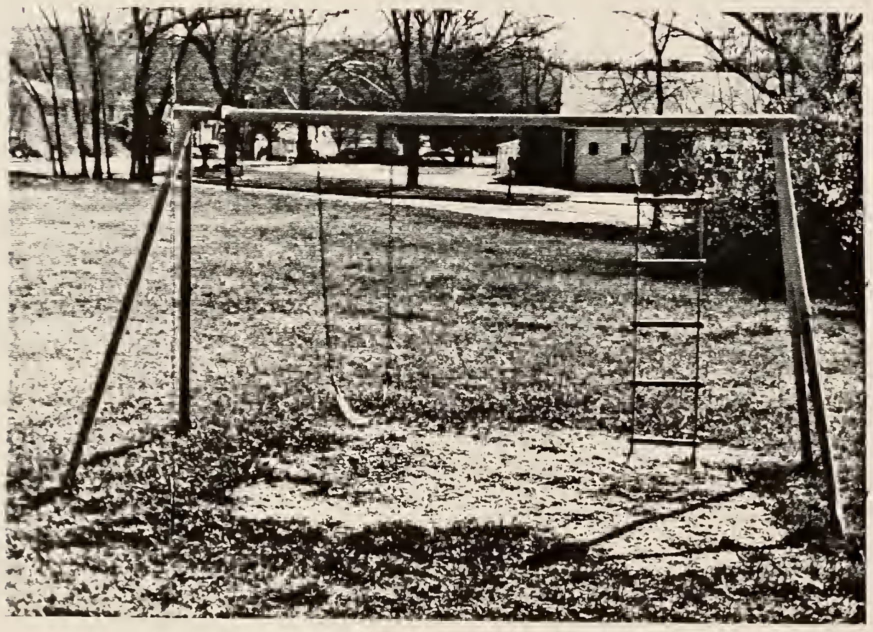

(a) sand play area

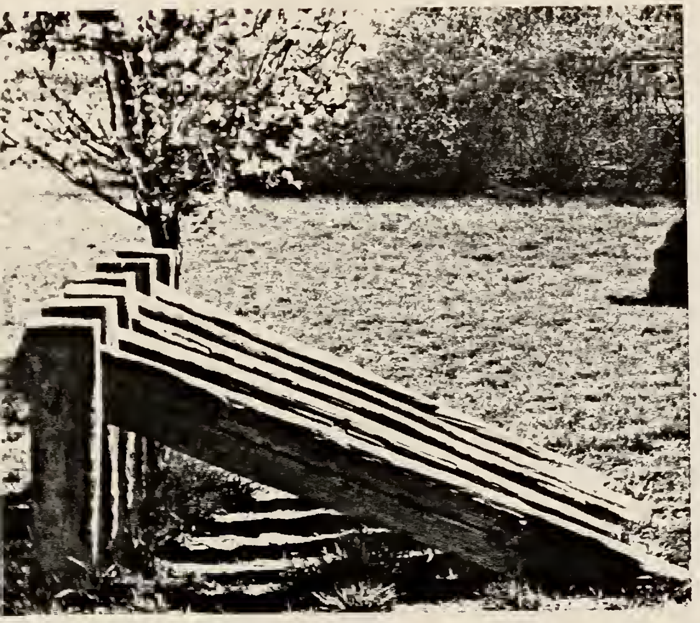

(b) jungle gym

(c) tricycle track

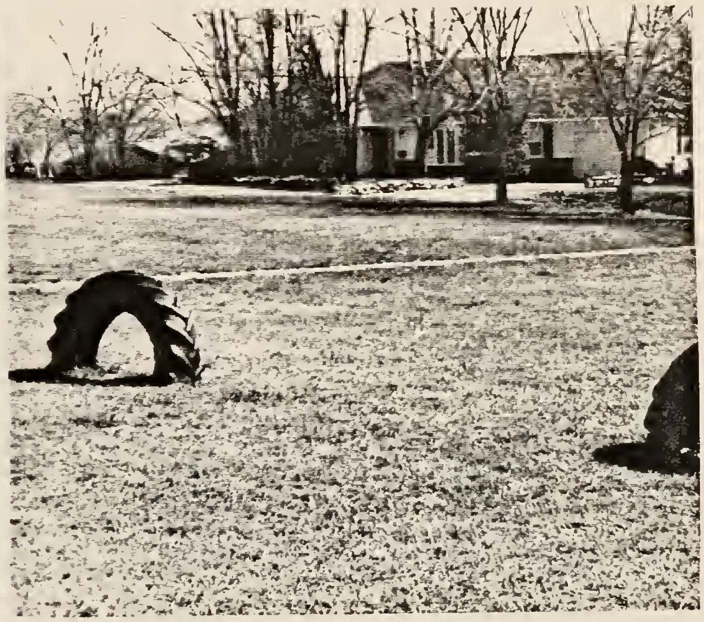
(d) swings

(e) three single slides


(f) two rope ladders
(Playground E)



(g) timber climbing structure



(g) partially buried tires

(i) "hoppity hop balls" (loose parts)
(Playground D)

Data Collection

Data were collected through unobtrusive observational field study methods. The researcher observed and recorded the naturally occurring phenomena of preschool children playing in the outdoor play environment of their child care centers. Each study site was visited an average of two times per week over a four week period from 16 November through 4 December 1987.

Instruments

Two data collection instruments were developed. The first instrument was designed as an aid in recording frequency of use of play units over time. The second instrument was designed to aid in recording the relationship between children's social patterns of play and play units over time.

To develop the instrument for collecting data on the frequency of play unit use, a list of play equipment and activity settings at each study site was made. This list of play units was entered across the top of a standardized gridded form. (see figure 3.13 for an example of this form) A cassette recording was made to give the researcher audio cues for ten second segments of time.

To collect the frequency of use data, the recorder used the time cue tape recording, and recorded the number of children using the first play unit during a ten second period of time, the recorder then directed his attention to the next play unit within the next ten second period, and recorded the number of children using that play unit within the following ten second period. This process was repeated consecutively for the duration of the children's outdoor play period. Data collection periods usually lasted for 30 minutes at Playgrounds A, B, C, and for approximately 12 to 15 minutes at Playgrounds D, E.

Figure 3.13 Sample data form: play unit use patterns

	Jungle Gym	Tunnel	Tire Swings (tree)	Climb	Slide	Tire Swing (struct.)	Sand	Trike Track	Platform	Wall/Hill	*Climbing structure board + ladders	
1	0	2	2	0	0	0	0	2	0	0	3	
2	0	0	2	1	0	0	0	2	0	0	4	
3	0	0	2	0	0	0	0	4	0	0	6	
4	0	1	1	0	0	1	1	1	0	0	3	
5	0	0	2	0	0	0	0	3	0	0	2	
6	0	0	1	0	0	0	2	1	0	0	1	
7	0	0	2	0	0	1	2	0	2	0	0	
8	0	0	2	2	2	0	2	0	0	0	0	
9	1	0	1	2	1	0	1	0	0	0	0	
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												

DATE/TIME: 18 Nov. 4pm

CENTER: 3

NO. OF CHILDREN: 9

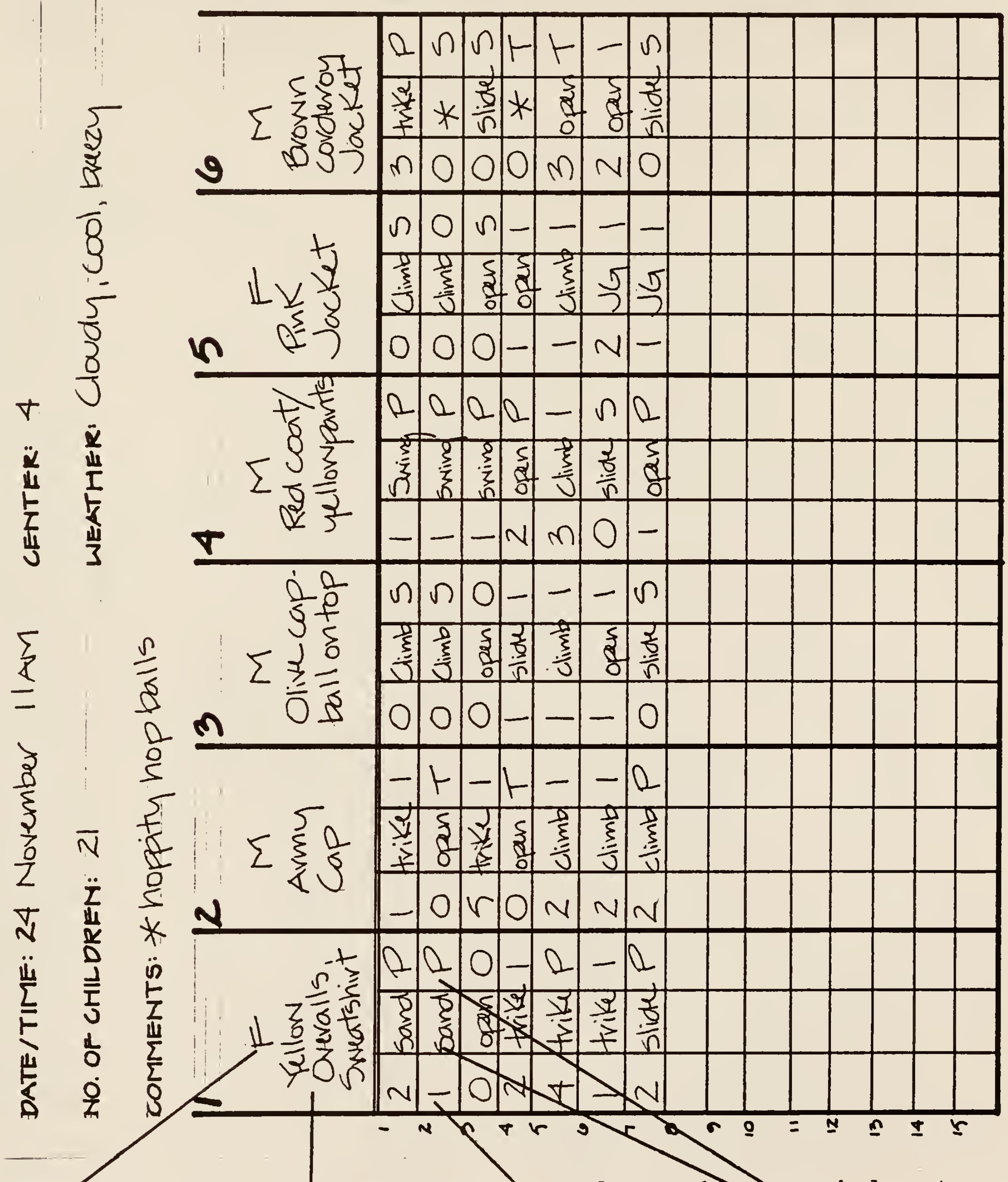
WEATHER: sunny, calm, cool

COMMENTS: sand toys out, dry sand

To develop an instrument for collecting data on children's social play patterns a standardized gridded form was developed (see Figure 3.14 for an example of this form). The top section of the form was divided into six major columns for each of the six target children which would be randomly selected for each data collection period.

Prior to each data collection session the names of nine children were randomly selected (six target children, and three alternates in case of absence). After arrival at the study site a teacher was asked to identify each target child for that data collection session. Identifiable features of each target child (such as gender and the color of clothing he/she was wearing) were entered at the top of the standardized form. For each target child, the play unit, the Parten (1932) social category of play (uninvolved, onlooker, solitary, parallel, interactive, or associating with a teacher), and the number of companions (if any) were using an audio cue "ten second on-ten second off" technique similar to the one described above.

Figure 3.14 Sample data form: social patterns of play



DATE/TIME: 24 November 11AM CENTER: 4

NO. OF CHILDREN: 21 WEATHER: Cloudy, cool, breezy

COMMENTS: * hoppity hop balls

	1			2			3			4			5			6		
	F Yellow Overalls, Sweatshirt			M Army Cap			M Olive cap-ball on top			M Red coat/yellow pants			F Pink Jacket			M Brown corderoy Jacket		
1	2	sand	P	1	trike	I	0	climb	S	1	swing	P	0	climb	S	3	trike	P
2	1	sand	P	0	open	T	0	climb	S	1	swing	P	0	climb	O	0	*	S
3	0	open	O	5	trike	I	0	open	O	1	swing	P	0	open	S	0	slide	S
4	2	trike	I	0	open	T	1	slide	I	2	open	P	1	open	I	0	*	T
5	4	trike	P	2	climb	I	1	climb	I	3	climb	I	1	climb	I	3	open	T
6	1	trike	I	2	climb	I	1	open	I	0	slide	S	2	JG	I	2	open	I
7	2	slide	P	2	climb	P	0	slide	S	1	open	P	1	JG	I	0	slide	S
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

social category of play:
U - uninvolved
O - onlooker
S - solitary
P - parallel
I - interactive
T - teacher

The data collection instruments were pretested in a city park to train the recorder before data collection. Rater reliability was checked by simultaneous coding with another recorder on three occasions during data collection. The degree of agreement for rater reliability was calculated by dividing the number of like codings by the total number of codings for each data collection format. The percent agreement for play unit use frequency based on 57 codings was 91.2%. Agreement for social play patterns based on 81 codings was 91.4%. A total of 990 codings were recorded for play unit use frequency, and 521 codings of the activities of 54 target children were recorded for social play patterns.

CHAPTER 4

RESULTS

Data were collected to determine percentage of use of play units by children and children's social interaction associated with play units. The first portion of this chapter will be devoted to descriptive analyses of the data on percentage of use of play units by playground, followed by a composite descriptive analysis. The second portion of this chapter will focus initially on the analyses of the data on social categories of play associated with individual play units, and secondly on an analysis of percentages of social play by playground.

PLAY UNIT USE

Analysis of Data

The purpose of this portion of the research project was to determine children's preferences for play units, as measured by distribution of use, in traditional and contemporary playground settings.

Each playground included in the study was visited two or three times over the data collection period to observe children and record the occurence of their play associated with the various play units. The information recorded on each coding form was arithmetically summarized in preparation for analysis. For each data cell the percentage of children in the playground involved with that play unit for that ten-second period was calculated:

$$\frac{\text{(number of children at play unit)}}{\text{(number of children in playground)}} \times 100 = \text{\% of use}$$

Next, the percentage of use figures were totaled for each date and the mean percentage of children involved with each play unit on each date was calculated:

$$\frac{\begin{array}{c}\text{(sum of \% of use}\\ \text{for a play unit on a given date)}\end{array}}{\text{(number of observations for a play unit)}} = \text{play unit use}$$

Standard deviations were calculated for the percentage of use figures as an indication of dispersion among codings for each play unit. Finally, play unit use means were summarized across dates and a total mean and standard deviation were calculated for play units by playground.

Frequency of Use of Play Units by Playground

Playground A

Playground A is contemporary in design. A visual analysis of Table 4.1 indicates that loose parts received the greatest percentage of use (M=20.5%, SD=4.8). Climbing (M=12.5%, SD=5.4) and sand play (M=11.3%, SD=7.7) received approximately the same percentage of use. The track for tricycle riding (M=9.8%, SD=5.8), swings (M=9.8%, SD=5.8), and the tunnel with a berm (M=8.8%, SD=7.0) also received approximately the same percentage of use. The tunnel set on the ground (M=1.5%, SD=1.1), the wide slide set on a berm (M=1.4%, SD=1.2), the observation deck (M=1.3%, SD=1.0), and the wide slide from the structure (M=0.4%, SD=0.6) received the least percentage of use.

Table 4.1 Means and Standard Deviations for Play Unit Use in Playground A

Time:	1 (n=90)		2 (n=60)		3 (n=90)		Total (N=240)		Bar Chart
Unit:	mean (%)	SD	mean (%)	SD	mean (%)	SD	mean (%)	SD	10% 20%
Loose Parts	22.2	22.2	13.9	18.4	25.2	7.1	20.5	4.8	xxxxxxxxxx
Climbing	4.9	9.2	15.3	15.3	17.1	16.8	12.5	5.4	xxxxxx
Sand Play	6.2	9.2	5.6	6.2	22.2	16.7	11.3	7.7	xxxxxx
Trike Track	18.5	15.7	2.8	6.2	8.1	9.0	9.8	6.5	xxxxx
Swings	2.5	4.6	16.7	4.8	10.1	6.7	9.8	5.8	xxxxx
Tunnel w/ berm	1.2	3.5	18.1	12.1	7.1	14.6	8.8	7.0	xxxx
Tunnel w/o berm	2.5	4.6	0.0	0.0	2.0	3.8	1.5	1.1	xx
Wide Slide w/ berm	1.2	3.5	0.0	0.0	3.0	4.3	1.4	1.2	x
Observ. Deck	2.5	7.0	1.4	3.1	0.0	0.0	1.3	1.0	x
Wide Slide w/ struct.	1.2	3.5	0.0	0.0	0.0	0.0	0.4	0.6	

Playground B

Playground B is contemporary in design. A review of Table 4.2 indicates that the swings (M=21.5%, SD=2.0) and the sand play area (M=19.5%, SD=9.2) received the most use on this playground. Climbing on the play structure (M=8.9%, SD= 3.4) ranked next in percentage of use. The observation deck (M=4.8%, SD=0.8) and the track for tricycle riding (M=4.3, SD 2.1) received approximately the same percentage of use. Other play units making up the play structure received approximately the same amount of use: a) suspension bridge (M=2.3%, SD=2.8), b) slide from the structure (M=1.9%, SD=1.4), and c) cargo net (M=1.6%, SD=0.2). The two wide slides received the least amount of use.

Table 4.2 Means and Standard Deviations for Play Unit Use in Playground B

Time:	1 (n=88)		2 (n=88)		3 (n=94)		Total (N=270)		Bar Chart
Unit:	%mean	SD	%mean	SD	%mean	SD	%mean	SD	10% 20%
Swing	23.5	8.8	18.8	9.2	22.3	4.6	21.5	2.0	xxxxxxxxxxx
Sand Play	32.4	5.9	13.2	5.5	12.5	9.6	19.4	9.2	xxxxxxxxxx
Climbing	4.4	4.9	12.5	12.7	9.8	12.4	8.9	3.4	xxxx
Observ. Deck	5.9	10.6	4.2	5.4	4.5	7.3	4.8	0.8	xx
Trike Track	2.2	4.1	3.5	6.2	7.1	5.2	4.3	2.1	xx
Tunnel w/ berm	0.0	0.0	0.0	0.0	8.9	8.1	3.0	4.2	xx
Loose Parts	*	*	*	*	3.5	6.6	3.5	6.6	xx
Susp. Bridge	0.0	0.0	0.7	1.8	6.3	4.7	2.3	2.8	x
Slide /structure	2.9	5.1	2.8	3.9	0.0	0.0	1.9	1.4	x
Cargo Net	1.5	3.9	1.4	2.4	1.8	2.8	1.6	0.2	x
Wide Slide /structure	2.2	2.9	0.0	0.0	0.0	0.0	.07	1.0	
Wide Slide /berm	0.0	0.0	0.0	0.0	1.8	4.4	.06	0.8	

* Loose parts were not available to the children during these data collection periods.

Playground C

Playground C is made up of a combination of traditional and contemporary elements set in isolated positions. As is indicated by the relatively large standard deviations of some of the total mean percentages of the play units, there were dissimilarities in use between some play units from one observation period to another (see Table 4.3). For example, no children were observed interacting with the observation deck at Time 1, and , in contrast, the mean percentage of use for that play unit at Time 3 was 18.6%. Loose parts (M=23.5, SD=2.1) had a relatively large amount of use at Time 2. The trike track (M=10.3%, SD=7.3), the swings (M=10.1%, SD=6.2), and the tunnel within the berm (M=9.5%, SD=9.2) had approximately the same percentages of use. The observation deck (M=6.8%, SD=8.0), adjoining slide (M=6.8%, SD=7.1), and climbing structure (M=6.1%, SD=3.6) were used in conjunction with one another, and thus had approximately the same amounts of use. The jungle gym (M=4.2%, SD=2.3) and the sand play area (M=4.0%, SD=4.3) had approximately the same percentages of use. Children showed the least interest in playing on the tire swing (M=0.8%, SD=1.2).

Table 4.3 Means and Standard Deviations for Play Unit Use in Playground C

Time:	1 (n=100)		2 (n=99)		3 (n=90)		Total (N=189)		Bar Chart
Unit:	%mean	SD	%mean	SD	%mean	SD	%mean	SD	10% 20%
Loose Parts	*	*	23.5	2.1	*	*	23.5	2.1	xxxxxxxxxxxx
Trike Track	0.0	0.0	16.1	1.5	15.0	1.2	10.3	7.3	xxxxx
Swing	3.3	5.5	18.5	5.2	10.0	9.7	10.1	6.2	xxxxx
Tunnel w/ berm	22.5	1.7	3.7	7.4	2.2	6.3	9.5	9.2	xxxxx
Path\Wall	10.8	1.3	0.0	0.0	10.1	2.8	7.0	4.9	xxxx
Observ. Deck	0.0	0.0	2.5	7.0	18.6	1.7	6.8	8.0	xxx
Slide/ Structure	0.0	0.0	3.7	7.4	16.7	1.4	6.8	7.1	xxx
Climbing	1.7	5.0	6.2	9.2	10.6	9.2	6.1	3.6	xxx
Jungle Gym	6.7	1.2	1.2	3.5	4.7	7.1	4.2	2.3	xx
Sand Play	0.0	0.0	9.9	9.7	2.1	4.0	4.0	4.3	xx
Tire Swing	0.0	0.0	2.5	4.6	0.0	0.0	0.8	1.2	

*Loose parts were not available to children on during these data collection sessions.

Playground D

Playground D was composed of traditional playground elements set in isolated positions surrounding a central open area. A visual analysis of Table 4.4 indicates that the children were most involved in riding "Big Wheels" on the trike track (M=25.2%, SD=12.9). Children also showed a relatively high interest in swinging (M=20.5%, SD=0.5) and playing in the sand area (M=16.3%, SD=3.2). Climbing structures (M=6.9%, SD= 3.3) and the jungle gym (M=6.9%, SD=3.3) were very closely related in percentage of use. Children showed the least interest in the slides (M=2.5%, SD=1.1).

Table 4.4 Means and Standard Deviations for Play Unit Use in Playground D

Time:	1 (n=36)		2 (n=28)		Total (N=64)		Bar Chart
Unit:	%mean	SD	%mean	SD	%mean	SD	10% 20% 30% 40%
Trike Track	12.3	3.0	38.1	3.4	25.2	12.9	xxxxxxxxxxxxx
Swing	19.6	2.1	21.4	2.4	20.5	0.9	xxxxxxxxxx
Sand Play	19.6	2.1	13.1	2.1	16.3	3.2	xxxxxxxx
Loose Parts	*	*	9.5	0.0	9.5	0.0	xxxxx
Climbing	10.1	6.5	3.6	2.1	6.9	3.3	xxx
Jungle Gym	10.1	6.5	3.6	4.0	6.9	3.3	xxx
Slides	1.5	2.1	3.6	2.1	2.5	1.1	x

* Loose parts were not available to children during this observation period.

Playground E

Playground E was composed of traditional playground elements set in isolated positions. A relatively large percentage of the children were involved in riding "Big Wheels" on the trike track (M=18.1%, SD=3.7). As in Playground D, the children showed similar interest in sand play (M=13.2%, SD=3.8) and swinging (M=12.6%, SD=3.6). The jungle gym received a moderate percentage of use (M=11.6, SD= 1.5). The table indicates similar percentages of children involved in sliding (M=7.5%, SD=0.4) and climbing (M=6.0, SD=1.6) activities. The rope ladders (M=2.4%, SD=1.0) were the play unit which least captured children's attention.

Table 4.5 Means and Standard Deviations for Play Unit Use in Playground E

Time:	1 (n=21)		2 (n=63)		3 (n=35)		Total (N=129)		Bar Chart
Unit:	%mean	SD	%mean	SD	%mean	SD	%mean	SD	10% 20%
Trike Track	23.2	1.3	16.7	1.5	14.4	12.0	18.1	3.7	xxxxxxxxx
Sand Play	10.2	10.7	18.6	8.5	10.8	6.4	13.2	3.8	xxxxxxx
Swing	8.3	3.9	12.3	11.8	17.2	13.8	12.6	3.6	xxxxxx
Jungle Gym	2.8	2.3	12.5	10.1	9.4	2.8	11.6	1.5	xxxxxx
Slide	13.9	4.5	7.8	5.3	4.4	3.3	7.5	0.4	xxxx
Climbing	6.5	4.7	7.6	4.3	3.9	3.8	6.0	1.6	xxx
Rope Ladder	3.7	1.3	1.3	2.0	2.2	2.7	2.4	1.0	x

Composite Play Unit Use

Similarities appear in the percentage of use of play units among playgrounds in the study. In an effort to gain further understanding of children's choices of play units across settings a composite table was developed (see Table 4.6). To accomplish this, similar play units from all of the study sites were combined and new means and standard deviations were calculated:

$$\frac{\text{(sum of play unit use means)}}{\text{(number of observation periods)}} = \text{(composite play unit use)}$$

Table 4.6 Composite of Means and Standard Deviations for Play Unit Use

Play Unit	# of sites w/ this play unit	Total (N=892)		
		%mean	SD	10% 20%
Swing	5	14.9	5.1	xxxxxxx
Loose Parts	4	14.3	8.1	xxxxxxx
Trike Track	5	13.5	7.3	xxxxxxx
Sand Play	5	12.8	5.2	xxxxxx
Climbing	5	8.1	2.4	xxxx
Jungle Gym	3	7.6	3.1	xxxx
Tunnel	3	5.7	3.5	xxx
Slide	3	4.7	2.5	xx
Observation Deck	3	4.1	5.5	xx
Suspension Bridge	1	2.3	2.8	x
Cargo Net	1	1.6	0.2	x
Tire Swing	1	0.8	1.2	
Wide Slide	3	0.8	0.4	

The play units appear to cluster in three major groups with swings (M=14.9%, SD=5.1), loose parts (M=14.3%, SD=8.1), trike tracks (M=13.5%, SD=7.3), and sand play (M=12.8%, SD=5.2) making up the group with the greatest percentage of use. The second group includes play units which support climbing activities. Climbing structures (M=8.1%, SD=2.4) and jungle gyms (M=7.6%, SD= 3.1) attracted approximately the same percentage of children's attention. The categories of slide (M=4.7%, SD=2.5), suspension bridge (M=2.3%, SD=2.8), cargo net (M=1.6%, SD=0.2), tire swing (M=0.8, SD=1.2), and wide slide (M=0.8, SD=0.4) received the least percentages of use.

SOCIAL INTERACTION

Variation in Social Play by Play Unit

Descriptive Data.

For each observation period data, were summarized using a two- way contingency matirix (play units x social categories of play); for example, the total number of times the target children were recorded as being involved in parallel play in the sand play area was recorded for each data collection period). The contingency tables were then summarized across data collection dates and playgrounds to create a composite two-way contingency table (play units x social categories of play) (see table 4.7).

Table 4.7 Composite Contingency Table (play unit x social category of play)

	Social Category of Play									
	Uninvolved		Onlooker		Solitary		Parallel		Interactive	
	Percentage of Total Number of Observations (N=518)									
	1.35%		8.30%		17.37%		23.55%		37.84%	
	Percentage of Observations by Social Category of Play									
Play Unit	#obs	%obs	#obs	%obs	#obs	%obs	#obs	%obs	#obs	%obs
Trike Track	0	0.0	6	14.0	7	7.8	20	16.4	23	11.8
Loose Parts	0	0.0	6	14.0	7	7.8	28	23.0	43	22.1
Swing	0	0.0	0	0.0	22	24.4	17	13.9	13	6.7
Tire Swing	0	0.0	0	0.0	0	0.0	2	1.6	9	4.6
Sand Play	0	0.0	2	4.7	18	20.0	21	17.2	9	4.6
Jungle Gym	0	0.0	0	0.0	3	3.3	1	0.8	10	5.1
Climbing	0	0.0	4	9.3	8	8.9	6	4.9	13	6.7
Observ. Deck	0	0.0	0	0.0	0	0.0	2	1.6	4	2.1
Tunnel	0	0.0	0	0.0	1	1.1	4	3.3	9	4.6
Wide Slide	0	0.0	1	2.3	2	2.2	0	0.0	0	0.0
Single Slide	0	0.0	0	0.0	5	5.6	2	1.6	5	2.6
Susp. Bridge	0	0.0	3	7.0	1	1.1	2	1.6	5	2.6
Cargo Net	0	0.0	0	0.0	3	3.3	1	0.8	5	2.6
Open Space	7	100.0	21	48.8	13	14.4	16	13.1	47	24.1
Total	7	100.0	43	99.6	99	99.9	122	99.8	195	100.2

```
       Table 4.8  Bar Chart: Percentage of Social Play by Play Unit
                ¦         10%       20%       30%       40%       50%    100%
Trike Track     ¦
Uninvolved      ¦
Onlooker        ¦xxxxxxxxxxxxxx
Solitary        ¦xxxxxxx
Parallel        ¦xxxxxxxxxxxxxxxxx
Interactive     ¦xxxxxxxxxxxx
                ¦
Loose Parts     ¦
Uninvolved      ¦
Onlooker        ¦xxxxxxxxxxxxxx
Solitary        ¦xxxxxxx
Parallel        ¦xxxxxxxxxxxxxxxxxxxxxxxx
Interactive     ¦xxxxxxxxxxxxxxxxxxxxxx
                ¦
Swing           ¦
Uninvolved      ¦
Onlooker        ¦
Solitary        ¦xxxxxxxxxxxxxxxxxxxxxx
Parallel        ¦xxxxxxxxxxxxxxx
Interactive     ¦xxxxxxx
                ¦
Tire Swing      ¦
Uninvolved      ¦
Onlooker        ¦
Solitary        ¦
Parallel        ¦xx
Interactive     ¦xxxxx
                ¦
Sand Play       ¦
Uninvolved      ¦
Onlooker        ¦xxxxx
Solitary        ¦xxxxxxxxxxxxxxxxxx
Parallel        ¦xxxxxxxxxxxxxxxxxx
Interactive     ¦xxxxx
                ¦
Jungle Gym      ¦
Uninvolved      ¦
Onlooker        ¦
Solitary        ¦xxx
Parallel        ¦x
Interactive     ¦xxxxx
                ¦
Climbing        ¦
Uninvolved      ¦
Onlooker        ¦xxxxxxxxxx
Solitary        ¦xxxxxxxx
Parallel        ¦xxxxx
Interactive     ¦xxxxxx
```

```
       Table 4.8 cont. Bar Chart: Percentage of Social Play by Play Unit
               ¦         10%       20%       30%       40%       50%    100%
Observ. Deck   ¦
Uninvolved     ¦
Onlooker       ¦
Solitary       ¦
Parallel       ¦xx
Interactive    ¦xx
               ¦
Tunnel         ¦
Uninvolved     ¦
Onlooker       ¦
Solitary       ¦x
Parallel       ¦xxxx
Interactive    ¦xxxxx
               ¦
Wide Slide     ¦
Uninvolved     ¦
Onlooker       ¦xx
Solitary       ¦xx
Parallel       ¦
Interactive    ¦
               ¦
Single Slide   ¦
Uninvolved     ¦
Onlooker       ¦
Solitary       ¦xxx
Parallel       ¦xx
Interactive    ¦xxx
               ¦
Susp. Bridge   ¦
Uninvolved     ¦
Onlooker       ¦xxxxxxx
Solitary       ¦x
Parallel       ¦xx
Interactive    ¦xxx
               ¦
Cargo Net      ¦
Uninvolved     ¦
Onlooker       ¦
Solitary       ¦xxx
Parallel       ¦x
Interactive    ¦xxx
               ¦
Open Space     ¦
Uninvolved     ¦xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Onlooker       ¦xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Solitary       ¦xxxxxxxxxxxxx
Parallel       ¦xxxxxxxxxxxxxx
Interactive    ¦xxxxxxxxxxxxxxxxxxxxxxxx
```

Loose parts and open space had the highest percentage of interactive play. Loose parts and tricycle riding had the highest percentage of parallel play. Swinging and sand play had the highest percentage of solitary play. Open space had the highest percentage of onlooker play. Open space had the highest percentage of uninvolved play. Teachers at Playground D and Playground E felt that the children should have a period of open play with little interaction with adults. Therefore, the "teacher" category was not included in this table. The total percentage of observations in which children were recorded as interacting with a teacher or adult was 6.0%

Variation in Social Play by Playground

Analysis of data.

For each observation period data were summarized using a two-way contingency table (play units x social categories of play); for example, the total number of times the target children were recorded as being involved in interactive play in the open space was recorded for each data collection period. The contingency tables were then summarized across data collection dates and play units to create a composite two-way contingency table (playgrounds x social categories of play) (see Table 4.9 Percentage of Social Play by Playground).

Table 4.9 Percentage of Social Play by Playground

	Playground									
	A		B		C		D		E	
# children	12		18		17		23		38	
mean age	2y-6mo		4y-3mo		4y-4mo		3y-10mo		4y-9mo	
play units/ child	.83		.67		.65		.30		.18	
	#obs	%obs	#obs	%obs	#obs	%obs	#obs	%obs	#obs	%obs
Social Category of Play										
Uninvolved	1	0.8	3	2.2	1	0.7	0	0.0	2	3.6
Onlooker	10	7.6	13	9.4	10	7.5	3	4.7	7	12.7
Solitary	31	23.7	16	11.6	31	23.1	16	25.0	5	9.1
Parallel	51	38.9	13	9.4	18	13.4	13	20.3	21	38.2
Interactive	25	19.1	59	42.8	67	50.0	26	40.6	19	34.5
Teacher	13	9.9	34	24.6	7	5.2	6	9.4	1	1.8
	131	100.0	138	100.0	134	99.9	64	100.0	55	100.0

Table 4.10 Bar Chart: Percentage of Social Play by Playground

```
                   |       10%       20%       30%       40%       50%
Uninvolved         |
Playground A       |x
Playground B       |xx
Playground C       |x
Playground D       |
Playground E       |xxxx
                   |
Onlooker           |
Playground A       |x
Playground B       |xxxxxxxxx
Playground C       |xxxxxxx
Playground D       |xxxxx
Playground E       |xxxxxxxxxxxx
                   |
Solitary           |
Playground A       |xxxxxxxxxxxxxxxxxxxxxxxx
Playground B       |xxxxxxxxxxxx
Playground C       |xxxxxxxxxxxxxxxxxxxxxxx
Playground D       |xxxxxxxxxxxxxxxxxxxxxxxxx
Playground E       |xxxxxxxxx
                   |
Parallel           |
Playground A       |xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Playground B       |xxxxxxxxx
Playground C       |xxxxxxxxxxxxx
Playground D       |xxxxxxxxxxxxxxxxxxxx
Playground E       |xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                   |
Interactive        |
Playground A       |xxxxxxxxxxxxxxxxxxx
Playground B       |xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Playground C       |xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Playground D       |xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Playground E       |xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                   |
Teacher            |
Playground A       |xxxxxxxxxx
Playground B       |xxxxxxxxxxxxxxxxxxxxxxxxx
Playground C       |xxxxx
Playground D       |xxxxxxxxx
Playground E       |xx
                   |
```

The highest percentage of interactive play was recorded on Playground C (traditional-contemporary type, mean age 4 years-4 months).

Approximately the same percentage of parallel play was recorded on Playground A (contemporary type, mean age 2 years-6 months) and Playground E (traditional type, mean age 4 years-9 months.) The smallest percentage of parallel play was recorded on Playground B (contemporary type, mean age 4 years-3 months).

Approximately the same percentage of solitary play was recorded on Playground A (contemporary type, mean age 2 years-6 months), Playground C (traditional-contemporary type, mean age 4 years-4 months), and Playground D (traditional type, mean age 3 years-10 months). The smallest percentages of solitary play were recorded on Playground B (contemporary type, mean age 4 years- 3 months) and Playground E (traditional type, mean age 4 years-9 months.

The smallest percentage of onlooker play was recorded on Playground A (contemporary type, mean age 2 years-6 months, .83 play units per child). The highest percentage of onlooker play was recorded on Playground E (traditional type, mean age 4 years- 9 months, .18 play units per child)

The highest percentage of uninvolved play was recorded on Playground E (traditional type, mean age 4 years-9 months, .18 play units per child).

CHAPTER 5
CONCLUSIONS AND OBSERVATIONS

Systematic observations and recordings were made of where and how young children play in an outdoor play environment in an effort to address five major questions:

1. How does the relative frequency of use of play units vary?
2. How does the type of playground setting, traditional or contemporary, appear to impact the relative frequency of use exhibited by children?
3. How does does the type of social interaction vary by play unit?
4. What are the relationships between categories of social play and play events?
5. How does playground type, traditional or contemporary, impact social interaction?

It appears that frequency of children's use of play units does vary, suggesting that children have preferences for the play units with which they choose to play. There also appear to be similarities across playground settings for the types of play units and activities with which children prefer to be involved. The play units which are provided on a playground seem to impact on where children choose to play. Some play units seem to be conducive to certain categories of social play. This chapter will first focus on analyzing children's frequency of use of play units and the associations which may exist between play units and social categories of play. An ordered list of play units based on frequency of use will be the framework for this discussion. Implications for design and further research will be discussed in the latter portion of the chapter.

PLAY UNITS AND SOCIAL INTERACTION

Trike Track. Hard surfaced areas for riding tricycles were the play units with the overall greatest percentage of use. Significant use of this play was particularly evident on Playground D and Playground E. These playgrounds are traditional in design and the tricycles offered one of the few elements which were manipulatable by children. Trike tracks seem to support predominantly parallel play. However, onlooker play was recorded suggesting that there should be some kind of "safe" area provided adjacent to trike tracks for watching and observing.

Loose parts. Loose parts were available in predominantly two types: a) materials that could be manipulated by children such as cardboard boxes or moveable toys, and b) climbing equipment which could be arranged by teachers into new forms. At each of the playgrounds, the children had been attending the centers for a period of time and had at least one free play period in the playground each day. Loose parts offered opportunities for novel experiences in an environment which predominantly contains static elements. During one data collection period at Playground A a variety of push toys were available. Most of the toys had some feature which made a noise when they were pushed or pulled. The children, particularly the boys, enjoyed parading around the playground making noise. Thus, the children were able to acts as agents of change through experimentation of tone and intensity of audio stimulation. High percentages of onlooker, parallel, and interactive play were associated with loose parts. This suggests that loose parts bring children together for interactive play. The abstract nature of loose parts was demonstrated during a sociodramatic play session in Playground C. Moveable climbing equipment was combined with the jungle gym creating the stage for an episode of "Star Trek." The fifteen minute session involved most of the children in the playground and was directed by a child, who was particularly adept at sociodramatic play. This suggests that space should be provided for play with loose parts adjacent to other activity areas, allowing for interactive play which is greater that the sum of the parts.

Swing. This play unit had approximately the same frequency of use as trike tracks, loose parts, and sand play areas. It is interesting to note that these other play units involve some form of constructive or manipulative play. Swinging, in contrast, involves a repetitive motor action which provides vestibular stimulation. Children appeared to prefer traditional types of swings which provided a rhythmic pendular action to tires swings which provided an erratic twisting motion. During observation periods teachers were often seen pushing children in swings, thus providing the children one-on-one contact with an adult. Solitary and parallel play were strongly associated with traditional types of swings. Interactive play was associated with tire swings.

Sand Play. Sand may be considered to be aform of "loose parts" in that it is a fluid element which can be modified by moisture content and added play materials. The ages of the children in the subject pool suggest that they are predominantly in the Piagetian preoperational stage and likely to be involved in constructive and symbolic play. This probably accounts for the high frequency of use of sand play areas. This was particularly evident in one child in Playground B, who tended to be involved in creating elaborate castles and villages in the sand play area. The frequency of use of the sand play area at Playground C was surprisingly low compared to other playgrounds. There are two possible reasons for this: a) The position of the sand area is somewhat isolated so that a child playing there may feel visually and vocally separated from children playing elsewhere; and b) The sand play area is large and lacks spatial definition; as a result the children who did use the area tended to play along an edge and did not venture into the center. This suggests that sand play areas should be proximal to other play areas and of a scale that allows a child to feel comfortable in the environment.

Jungle Gym. Jungle gyms were present in Playground C, Playground D, and Playground E. Much of the play on jungle gyms was interactive. Jungle gyms seem to act as points where children gather to converse. They may also serve as a setting for sociodramatic play or gross motor exercise.

Climbing. The climbing structures on Playground A and Playground B were centralized within the play settings. When moving from one part of the playground to another the children's paths often included a route via the structure. The structures seemed to act as reference points and gathering places for social interaction. In Playground A, a small nook under one of the sets of stairs served as a hiding place and space for social interaction. In Playground D and Playground E the climbing structures are located along the perimeter of the play environment.

Children were often seen individually or in small groups sitting or conversing away from the activity of the central area. This probably accounts for the high percentage of onlooker and solitary play associated with this play unit.

Observation Deck. Observation decks were available in Playground A, Playground B, and Playground C. They were used infrequently and for short durations in all settings. Parallel and interactive play were associated with this play unit. Although the observation decks provided a space which could be used as a setting for sociodramatic play, the children seemed to be more interested in more physically active forms of play. Providing the children with props for sociodramatic play might stimulate greater use of the observation decks.

Tunnel. Tunnels were used predominantly as paths and hiding places for games of chase. This is indicated by the predominance of parallel and interactive play associated with this play unit. This suggests that tunnels should be placed where they can act as linkages and viewing positions to other spaces. During early observation periods in Playground C pecans were ripening and falling from the trees. The children straddled the concrete tunnel and used the hard surface to crack pecans. This accounts for the relatively high frequency of use in this playground.

Slide. Two varieties of slides were observed in the study: a) shallow wide slides which were wide enough for two children to use at one time, and b) tall narrow-traditional types of slides. Slides as a group were used very little. The surfaces of the wide slides tended to be oxidized, increasing the amount of friction encountered by children who tried to use the slides. This, in combination with the shallow angle, forced children to use their feet to propel themselves down the slide. Thus children who attempted to use these slides may have found the experience to be unsatisfactory. At any rate, they did not repeat the action. No children were observed using a wide slide in a parallel fashion. This raises a question as to whether wide slides actually inspire parallel and interactive play. Possibly wide slides need to be placed at a steeper angle and constructed of a slick material. The tall, narrow slides were used more frequently than the shallower wide slides. This may indicate that the relative danger and challenge of the taller slides were more important to children in selecting a slide than the opportunity for parallel action with other children. When the tall narrow slides were used, it tended to be the result of an interactive game. Children observed in solitary play seemed to quickly tire of the repetitive action of sliding down, running around, climbing up, and sliding down again. This suggests that if slides are incorporated into a playground they may best serve as a pathway allowing movement from one level to another rather than as a motor activity.

Suspension bridge. The only suspension bridge in the study was in Playground B. It links portions of the climbing structure and was used as a path or observation point. Children tended to move through this play unit quickly and intermittently, suggesting that it probably received more use than is indicated by its frequency mean.

Cargo net. The only cargo net in the study was in Playground B. It was attached to the main climbing structure and led from a sand play area to a platform. Much of the play associated with this play unit was in the form of large motor exercise by individuals or small groups of children.

Open space. Much of the play in open space took the form of watching other children play or interactive chase and wrestle types of games. The greatest percentages of onlooker play and interactive play were recorded in open spaces. This suggests the need for sufficient open space for physical activity which is linked into the system of other play units. To create a more dynamic play environment open spaces may vary in the degree of spatial enclosure and may be provided with loose parts.

SOCIAL INTERACTION AND PLAYGROUND TYPE

A number of authors have suggested that providing linkages in the physical structure of a play environment promotes social interaction between children. Therefore, there should be more social interaction on contemporary types of playgrounds when compared with traditional types of playgrounds. The data from this study suggest that there are other factors which may also be involved in social interaction between children in outdoor play environments.

Parten (1932) proposed that complexity of social play increases as children grow older and have more experience with the social and physical environment. The findings of this study seem to support that theory. The children playing in Playground A were the youngest group in the study with a mean age of 2 year-6 months. In this playground, parallel play was the predominant form of social interaction.

The highest level of interactive play was recorded on Playground C which had the greatest physical distance between play units. The curriculum of this program fostered social interaction. It appears that this learning may have generalized to the outdoor play environment. The children tended to play in groups moving from one play unit to another. This may account for the lack of significant differences between frequencies of use of play units on this playground.

The oldest group of children, with a mean age of 4 years-9 months, were in Playground E. High percentages of uninvolved play, onlooker play, and parallel play were observed on this playground. This may be due to the low number of play units available per child (.18). The trike track was the play event with the greatest percentage of use, accounting for the high percentage of parallel play. The trike track on this playground seemed to serve as a "free-way" with few vocal interactions. When the children did speak to one another it was often to tell another child to get out of the way. Therefore, it appeared that the social interaction fostered by the trike track appeared to be aggressive in nature rather than cooperative.

Uninvolved. All of the uninvloved play occured in open spaces. In Playground B "time out" was to disciplinary techinique, and was recorded as uninvolved play.

Onlooker. Children tended to watch the other activities of other children from the open spaces. There were a limited number of "Big Wheels" available during the free play periods. This resulted in a number of children standing and observing the active play in this area. Climbing structures served as outlook postions for children to watch the activities of others.

Solitary. Children tended to be involved in solitary play when swinging or involved with sand play areas.

Parallel. Children tended to be involved in parallel play when swinging, riding tricycles, or involved in sand play areas. In Playground A "loose parts" seemed to stimulate parallel play. This may be due to the developmental ages of the children (mean age 2 years-6 months).

Interactive. "Loose parts" and open spaces tended to foster the highest percentages of interactive play. High percentages of interactive play were also observed to be associated with trike tracks. However, these social interaction did not always appear to be cooperative in nature.

IMPLICATIONS FOR DESIGN

Three of the four play units (trike track, loose parts, sand play) which received the greatest frequency of use involved some form of manipulative or constructive play. In Playground D and Playground E, which offered the fewest number of play units in the study, the trike track was used nearly to capacity at all times. In contrast, Playground B which offered the largest number of play units, the swings, the sand play area, and the climbing structure had greater percentages of use than the trike track. This suggests that if children are provided with a wider selection of play units, they may prefer other activities to tricycle riding. Spaces for constructive and manipulative play may form the core of the playground setting around which other elements may be organized.

The fourth play unit which made up this high use group, was swings which offer an opportunities for vestibular stimulation. They also offer a potential safety hazard if the zone is not well defined warning children to be cautious and avoid the path of an oncoming swing. This suggests that swings should be included in the play environment, however, they should be located away from the central activity area.

Climbing structures offer children a variety of spatial and motor experiences. They also seem to be a position from which children like to watch other children's play activities. This suggests that climbing structures should be adjacent to the core activity area, providing pathways to other play units and spaces for viewing other play units.

It appears that children need spaces conducive to passive activity away from the main activity area. Smaller, more intimate spaces which support small group conversations and observation types of activities should be incorporated into the playground. Tunnels may offer one form of enclosed personal space.

Children appear to have a need for reference points in their environment in which they may gather for social interaction. The jungle gyms in Playground C, Playground D, and Playground E provided this sort of interaction point. This suggests the need for providing spaces at key junctures within the playground for reference and meeting. These spaces may provide the setting with a unique character which gives the playground setting a sense of place. Shaw (1987) suggested that a designer has been successful in creating a sense of place when children name particular locations within the playground setting.

IMPLICATIONS FOR RESEARCH

This study has recognized limitations in that it involved a limited number of observation dates during the fall of the year. However, some patterns of frequency of use of play units and associations between play units and social play seem to have emerged. A similar study which involved data collection periods throughout the year on a larger number of playgrounds would be helpful in providing information which is more generalizable. It may be important to include children's age as a variable in the research design.

The data collection procedure worked well and did not appear to have an influence on children's activities. Other studies have also collected data on the functional level of play with which children were involved (Campbell & Frost, 1985; Henninger, 1985; Winter, 1985). This would appear to be a good addition to subsequent studies in order to gain a further dimension of play value.

Although playground type does not appear to have a strong impact on the types of social interactions which occur, play units do appear to stimulate and support varying categories of social play. Loose parts appear to foster high levels of parallel and interactive play. It would be interesting to see if this holds true in adventure playgrounds, where activities are structured largely around loose parts and constructive play.

This study seems to indicate that children do have preferences for some play units over others. Namely, it would be interesting to compare where children say they would like to play with field observations of where they actually play. Findings from this type of study might have applications in developing participatory design processes which include children.

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APPENDIX A

SOCIAL CATEGORIES OF PLAY MATRICES

Table A.1 Play Unit Contingency Matrices (playground x social category of play)

Trike Track

	Playground A	B	C	D	E	Total
Unoccupied	0	0	0	0	0	0
Onlooker	0	0	4	0	2	6
Solitary	1	0	6	0	0	7
Parallel	1	0	2	4	13	20
Interactive	2	0	12	5	4	23
Teacher	0	0	0	0	0	0
Total	4	0	24	9	19	56

Loose Parts

	Playground A	B	C	D	E	Total
Unoccupied	0	0	0	0	*	0
Onlooker	3	0	3	0	*	6
Solitary	4	2	0	1	*	7
Parallel	21	0	7	0	*	28
Interactive	11	16	14	2	*	43
Teacher	3	3	1	1	*	8
Total	42	21	25	4	*	92

* Loose parts not available to children on this playground.

Swing

	Playground A	B	C	D	E	Total
Unoccupied	0	0	0	0	0	0
Onlooker	0	0	0	0	0	0
Solitary	1	0	11	7	3	22
Parallel	10	0	0	5	2	17
Interactive	6	0	1	6	0	13
Teacher	1	0	1	0	0	2
Total	18	0	13	18	5	54

Tire Swing

	Playground					
	A	B	C	D	E	Total
Unoccupied	*	*	0	*	*	0
Onlooker	*	*	0	*	*	0
Solitary	*	*	0	*	*	0
Parallel	*	*	2	*	*	2
Interactive	*	*	9	*	*	9
Teacher	*	*	1	*	*	1
Total	*	*	12	*	*	12

* Tire swings were not available to children on these playgrounds..

Sand Play

	Playground					
	A	B	C	D	E	Total
Unoccupied	0	0	0	0	0	0
Onlooker	0	1	1	0	0	2
Solitary	8	3	7	0	0	18
Parallel	9	1	11	0	2	21
Interactive	0	1	6	0	0	9
Teacher	2	3	2	0	0	7
Total	19	9	27	0	2	57

Jungle Gym

	Playground					
	A	B	C	D	E	Total
Unoccupied	*	*	0	0	0	0
Onlooker	*	*	0	0	0	0
Solitary	*	*	3	0	0	3
Parallel	*	*	0	1	0	1
Interactive	*	*	3	4	3	10
Teacher	*	*	0	0	0	0
Total	*	*	6	5	3	14

* Jungle gyms were not available to children on these playgrounds.

Climbing

	Playground					
	A	B	C	D	E	Total
Unoccupied	0	0	0	0	0	0
Onlooker	0	2	0	1	1	4
Solitary	1	2	0	3	2	8
Parallel	0	3	0	1	2	6
Interactive	0	5	0	5	3	13
Teacher	0	8	0	0	0	8
Total	1	20	0	10	8	39

Observation Deck

	Playground					
	A	B	C	D	E	Total
Unoccupied	0	0	0	*	*	0
Onlooker	0	0	0	*	*	0
Solitary	0	0	0	*	*	0
Parallel	0	2	0	*	*	2
Interactive	0	3	1	*	*	4
Teacher	0	1	0	*	*	1
Total	0	6	1	*	*	7

* Observation decks were not available to children on these playgrounds.

Tunnel

	Playground					
	A	B	C	D	E	Total
Unoccupied	0	0	0	*	*	0
Onlooker	0	0	0	*	*	0
Solitary	0	0	1	*	*	1
Parallel	4	0	0	*	*	4
Interactive	3	3	3	*	*	9
Teacher	0	0	0	*	*	0
Total	7	3	4	*	*	14

* Tunnels were not available to children on these playgrounds.

Wide Slide

	Playground					
	A	B	C	D	E	Total
Unoccupied	0	0	0	*	*	0
Onlooker	1	0	0	*	*	1
Solitary	2	0	0	*	*	2
Parallel	0	0	0	*	*	0
Interactive	0	0	0	*	*	0
Teacher	0	0	0	*	*	0
Total	3	0	0	*	*	3

* Wide slides were not availabe to children on these playgrounds.

Slide

	Playground					
	A	B	C	D	E	Total
Unoccupied	*	0	*	0	0	0
Onlooker	*	0	*	0	0	0
Solitary	*	2	*	3	0	5
Parallel	*	0	*	1	1	2
Interactive	*	0	*	1	4	5
Teacher	*	0	*	0	0	0
Total	*	2	*	5	5	12

* Slides (single) were not available to children on these playgrounds.

Suspension bridge

	Playground					
	A	B	C	D	E	Total
Unoccupied	*	0	*	*	*	0
Onlooker	*	3	*	*	*	3
Solitary	*	1	*	*	*	1
Parallel	*	2	*	*	*	2
Interactive	*	5	*	*	*	5
Teacher	*	3	*	*	*	3
Total	*	14	*	*	*	14

* Suspension bridges were not available to children on these playgrounds.

Cargo net

	Playground					
	A	B	C	D	E	Total
Unoccupied	*	0	*	*	*	0
Onlooker	*	0	*	*	*	0
Solitary	*	3	*	*	*	3
Parallel	*	1	*	*	*	1
Interactive	*	5	*	*	*	5
Teacher	*	0	*	*	*	0
Total	*	9	*	*	*	9

* Cargo nets were not available to children on these playgrounds.

Open space

	Playground					
	A	B	C	D	E	Total
Unoccupied	1	3	1	0	2	7
Onlooker	6	7	2	2	4	21
Solitary	5	3	3	2	0	13
Parallel	6	4	3	1	2	16
Interactive	3	21	17	3	3	47
Teacher	7	16	2	5	1	31
Total	28	54	28	13	12	135

Play Unit Preferences and Social Play of Young Children in Preschool Playgrounds

by

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B.S.L.A., Washington State University, 1981

An Abstract of a Master's Thesis

submitted in partial fulfillment of the

requirements of the degree

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1988

ABSTRACT

Development is a process through which children's interaction with their environment leads to an increasingly complex understanding of the world and their place within it. Play is one of the primary vehicles through which child/environment interactions occur. Children's play environments can be separated into three broad categories: a) traditional type playgrounds, b) contemporary type playgrounds, and c) adventure type playgrounds. Factors which may be used to measure the play "value" of play equipment and settings include: a) children's willingness and desire to become involved in an activity, b) the degree to which children's physical activities are stimulated and supported, and c) the degree to which social interaction between children is stimulated and supported. Data were collected through unobtrusive field study techniques of naturally occuring patterns of preschool children playing in the outdoor play environments of their child care centers. Children demonstrated preferences, measured as frequency of use, for play events which could be manipulated by them or manipulated by adults to create novel experiences. Children demonstrated disinterest in single function equipment which encouraged simple repetitive motor exercise. Increased levels of social interaction were associated with play events which provided manipulatable elements. Physical design of play environments should provide spaces for interaction with materials and other children rather than fixed-use equipment.